

Dental

Abstracts

a selection of world dental literature

AMERICAN DENTAL ASSOCIATION

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Abstracts

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AMERICAN DENTAL ASSOCIATION

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3

to supply enough data in each abstract so that the reader may determine whether he wishes to refer to the original article for more complete information.

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Periodontics and endodontics



Endodontics

Anatomy of root canals

(Die Anatomie der Wurzelkanäle)

W. Meyer. *Zahnarztl.Rundschau* 64:532-534
Oct. 20, 1955

A complete knowledge and understanding of the minutest details of the anatomy of root canals is important in every root canal treatment. During the last 50 years, several reports have appeared in dental literature on the anatomy of root canal structures and on root canal therapy. Most authors advocated various plans of procedure but emphasized a common principle in the preparation of the canals: the softening of the pulp by soaking and the cleansing of the root canal by irrigation. After the canal was cleared of pulp nodules and

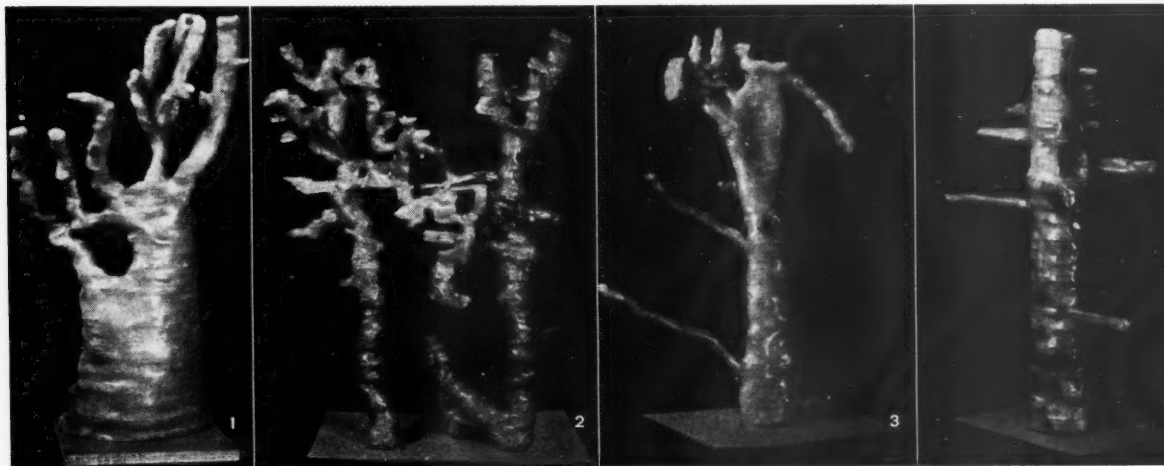
other calcareous deposits, the still incompletely emptied canals were filled with certain viscid materials such as colloid, India rubber or gutta-percha. These materials then coagulated in the root canal. Such methods, however, were and are disadvantageous because it is impossible to fill extremely narrow root canals with such materials.

There are several different steps that must be carried out successfully before a root canal treatment can achieve satisfactory results: there must be a careful selection of cases, a correct instrumentation of the canal, a complete sterilization, and finally the root canal must be filled in its vertical dimension. The material used for filling must be nonabsorbable, contain no volatile constituent, and be impervious to moisture.

To obtain the necessary complete knowledge and understanding of the anatomy, however, a model should be constructed from uninterrupted serial sections. Every section of the root canal is projected on a screen, then drawn, the drawings transposed to thick wax plates, cut out, and then reassembled according to their sequence. After the root canals have been formed correctly as to form and size to the minutest detail, these models are enlarged to approximately 50 times their original size.

These models reveal clearly the finest root canal branches that are not observable when different

Models of root canals: (1) Lower right second molar. (2) Upper left bicuspid with twenty-four branches. (3) Upper left bicuspid. (4) Upper right incisor with twelve branches



methods are used. It has been assumed that ramification of root canals occurs in not more than 20 to 30 per cent of the instances. The wax models, however, reveal such ramifications in more than 70 per cent.

Although previous reports described the occurrence of from two to six independent root canal branches, there were up to 24 separate branches observed in the wax models. The anatomic structure of each root canal, and the kind and prevalence of the lateral root canal branches vary in each patient and in each tooth.

The accompanying illustrations show several specimens of abnormal root canal ramifications. Such ramifications were observed in patients between 15 and 20 years old, occurring in bicuspid mainly. Previous reports, however, mentioned neither the occurrence of ramifications in the root canals of bicuspid of young patients nor such a multiplicity of branches.

Tissue response to endodontic treatment

R. F. Sommer. *Internat.D.J.* 5:209-224 June 1955

The cardinal principles of endodontics as they pertain to tissue healing are evaluated and incorporated with the accepted ideas agreed upon at the World Conference on Endodontics, sponsored by Louis Grossman in Philadelphia in 1952. Because of the remarkable defensive and reparative function of pulp tissue, greater efforts should be made to maintain the integrity of vital pulps. Burkman, Schmidt and Crowley have shown that the intermediate infected layer of carious dentin can be sterilized effectively by applying a mixture of one soluble penicillin pellet containing 50,000 units suspended in one drop of camphorated paramonochlorophenol. Pulp capping in young healthy teeth in which there is no carious exposure may be successful. Success in vital pulp amputation should not be determined by a dentin bridge over the pulp stump, but rather by the health of the pulp tissue remaining in the canal. If the root canals of teeth with granulomas are rendered nontoxic and sterile and are hermetically sealed to the dentocemental junction, reversion of the granuloma to normal bone will follow without surgical intervention or the stimulation of foreign

medicaments. The primary objective of endodontic treatment is the elimination of microorganisms or toxic proteins from the root canal, followed by complete hermetic sealing of the entire canal. For clinical evidence of bacterial elimination, the culture method is preferable.

Recent developments in endodontics

P. Noakes. *New Zealand D.J.* 51:64-69 April 1955

The search for drugs that destroy bacteria in a root canal is reviewed. Penicillin is paramount for atoxicity and effectiveness against gram-positive organisms present in infected root canals, but organisms have now developed which are resistant to penicillin. Penicillin, streptomycin and dihydrostreptomycin have narrow spectrums and are effective against either gram-positive or gram-negative organisms, but not against both. Chlortetracycline and chloramphenicol are broad-spectrum antibiotics; the former has an acid base and is likely to irritate the apical tissues and stain the tooth; both are weaker in action than narrow-spectrum antibiotics and may be antagonistic to penicillin. There is no antibiotic suitable for root canal therapy which is effective against yeasts, but a chemical, sodium caprylate, is effective against *Candida albicans*. Because no one drug is effective against all three groups of microorganisms, a combination of drugs must be used for maximum effect. A satisfactory mixture is penicillin, streptomycin and sodium caprylate. Compounded with a base such as propylene glycol and loaded in empty anesthetic carpules, it can be injected into a root canal through a wide-bore needle. The proportions are as follows: penicillin, 400,000 units; streptomycin, 0.50 Gm.; chloramphenicol, 0.25 Gm.; chlorcyclizine hydrochloride (Parazil), 200 mg., and propylene glycol, 1 ml.

The quaternary ammonium compounds are of the greatest value in root canal therapy, but care must be taken in using them. They are of two types. The anionic type has a detergent action, dissolves the fatty end products of protectin putrefaction, is excellent for root canal therapy, but is not antiseptic. The cationic type is highly antiseptic but not detergent. Because anionic and

cationic compounds will not mix, a drug of the one type used in a canal must be removed before a drug of the other type is introduced.

The treatment of teeth with necrotic pulps is discussed. Three points concerning the use of antibiotics in root canals are stressed. The paste must be in contact with the dentinal walls throughout the entire length of the canal. Canals must be enlarged to permit sufficient concentration of antibiotics. Chemical incompatibilities must be avoided.

A radical approach to indications and contraindications of root canal therapy

Charles R. Gruenberger. *J. Kentucky D.A.* 7:7-10 July 1955

Recent improvements in the technics of root canal therapy justify a more radical approach to evaluating the advisability of performing root canal therapy. The following major factors which determine the advisability of this operation are discussed: the value of the tooth, ability to perform the operation, restorability of the tooth, economic evaluation of the procedure, and the patient's systemic and oral condition.

The tooth must not be evaluated as a unit but as a part of a system made up of a group of teeth. Because of lack of training, many dentists are ill-equipped to perform simple endodontic procedures and have not seen the results produced by a sound, modern technic. Endodontic treatment should be considered an adjunct to restoration. In an economic assessment of the operation, considerations include the alternatives to root canal therapy and their comparative prognoses and cost. In weighing the patient's physical condition, many conditions accepted as contraindications have recently been shown not to be so. The author has had surprisingly successful results, despite negative prognoses.

The mechanical situation favoring placement of a rubber dam, access to the pulp chamber and entrance into the canal should be present. Pulp stones, partial obliteration of the pulp and abnormal pulpal anatomy are not insurmountable obstacles provided the operator dissects the hard structure of the tooth with care and aptly observes the roentgenograms. Previously performed unsuc-

cessful endodontic treatment is no criterion for assuming a poor prognosis for re-treatment, provided the failure of the previous treatment can be traced to its cause, and correction of the failure anticipated. Fractured roots are amenable to endodontic procedures if the fracture is in the apical portion. Replantation of root canal-treated teeth is indicated only under ideal conditions. Two adjacent teeth requiring endodontic treatment should be operated on simultaneously. Any systemic condition which contraindicates endodontic treatment also contraindicates extraction, and the lesser of the two evils must then be selected. Systemic contraindications for endodontic treatment include any chronic debilitating disease, or a condition of impaired reaction which may develop or be aggravated by such treatment.

Antiseptics and disinfectants in endodontia (Antisépticos y desinfectantes en endodoncia)

José Oynick V. *Rev.A.D.Mexicana*
12:51-60 March-April 1955

An ideal antiseptic for root canals should meet the following requirements: It should be (1) germicidal for all organisms, (2) rapidly effective, (3) capable of penetrating deeply, (4) effective in the presence of organic matter, (5) noninjurious to the periapical tissues, (6) nonstaining to the teeth, (7) chemically stable, (8) odorless and tasteless and (9) economical. Camphorated parachlorophenol (two parts of parachlorophenol to one part of camphor) is considered by the author to be the drug that most nearly meets these requirements. In addition, it can be used effectively in combination with penicillin.

Although some authorities contend that the results obtained with antibiotics are no better than those obtained with antiseptics, antibiotic preparations possess the advantage of acting more rapidly, especially in acute processes, with a consequent reduction in the number of sessions required. Antibiotic therapy, however, is not advisable in canals with parietal degenerative calcifications, nodules or dentin tubules profoundly infiltrated by microorganisms as a result of long-standing infection. In such instances, powerful, easily diffusible antiseptics, electrolytic technics, or methods of impregnation and precipitation

should be used. By contrast, antibiotics, which act only on contact, are indicated in the treatment of infected root canals (with or without periapical involvement) that are accessible all the way to the apex and capable of being adequately widened. They should not be used in constricted canals because the antibiotic preparation must touch the dentinal walls of the canal even in the most distant regions if it is to be completely effective. Ample widening of the canal not only permits the use of a larger quantity of the preparation, but since it requires thorough curettage of the walls, it also assures removal of the infected layers of dentin. Many antibiotics are incompatible with various chemical substances, and as the use of such substances cannot be avoided entirely, the canal must be thoroughly irrigated whenever necessary in the course of treatment to minimize the danger of antibiotic inactivation.

Endodontics, no less than medicine, offers a fruitful field for experimentation with antibiotics, especially when they are used in combination.

Aerobes and anaerobes in endodontics

Joseph M. Leavitt, Irving J. Naidorf
and Pauline Shugaevsky. *New York J.D.*
25:377-382 Dec. 1955

Undetected anaerobes have been suspected in an undetermined percentage of root canal treatments, even though two consecutive cultures with routine culture technics remain negative. These undetected anaerobes may be the cause of some "failures" in root canal therapy. A closed system culture technic is desired, in which alkaline pyrogallol is used as an oxygen absorber. Dextrose broth was used as the standard medium in the tests with the single tube or the multiple tube jar system.

Of 35 instances cultivated anaerobically, five, or 14.3 per cent, showed positive anaerobic cultures after having yielded two consecutive negative cultures with the routine aerobic culture media.

There is need for a sensitive culture medium which will detect both aerobes and anaerobes. Several media were tested. A culture medium containing trypticase soy broth plus 0.1 per cent agar was found to be stable at room temperatures

and sensitive to both aerobic and anaerobic growth. The use of a medium of this type may eliminate some of the "failures" in endodontic therapy.



Periodontics

The incidence of periodontal diseases in the Punjab

H. Akhter. *Pakistan D. Rev.* 5:109-110
July 1955

The author and a colleague recently conducted a survey of Punjab school children in both rural and urban areas. The children ranged in age from ten to 16 years. Almost 95 per cent of those examined showed signs of periodontal diseases, chiefly hypertrophic gingivitis. Adults observed generally showed active resorption of the alveolus with or without the presence of pus. It can be assumed that the greater part of the Punjab's population, young and old, have periodontal disease.

The etiology is unknown. It appears that many instances of the disease are manifestations of various systemic disorders. The incidence of periodontal disease is considerably higher in the countries of the East than in the West. Diet and lack of oral hygiene may be causative factors. A large percentage of young patients from the northern districts of the Punjab suffer from both amebic dysentery and gingivitis. Their gums are congested, dark and slightly swollen. The dysentery must be treated first.

Some years ago the author conducted a dental survey of school children in the Punjab selected and grouped according to family income. It was observed that students from the higher income group had a higher caries incidence, but that periodontal disease was more prevalent among children of the low income group. Periodontal disease was pronounced among children from rural schools at Kanakacha and Aminabad. Most patients showed deep pockets and pus discharge on pressure. Few instances of early gingivitis were noted. Oral hygiene is lacking in these rural areas, and to a somewhat lesser degree among the

school children of Lahore. Among adults, periodontitis is more common than is gingivitis.

The chewing of "pan"—fresh leaves of a creeper plant, smeared with a combination of slaked lime and "Kutha" prepared from a bark containing tannic acid, to which are added crushed betel nut and tobacco—is said to contribute to the high incidence of periodontal disease. People who chew pan generally show a slight inflammation of the gums with pronounced alveolar resorption and deep pockets, and attrition of the occlusal surfaces of the molars and bicusps and of the incisal edges of the anterior teeth. Pan chewing is not a contributing factor to periodontal disease as the essential conditions noted in such addicts are also found in other patients of the same age. Intestinal parasites—amebic dysentery, intestinal worms and so forth—are often found in conjunction with periodontal disease, but much work remains to be done before it is known to what extent this factor influences the incidence of periodontal disease.

**Alkaline phosphatase
in periodontal tissues: histochemical study**
(Estudio histoquímico de la fosfatasa alcalina
en los tejidos periodontales)

F. A. Carranza and R. L. Cabrini. *Rev. As.
odont. Argentina* 43:206-220 June 1955

The distribution of alkaline phosphatase in the periodontal tissues of 15 patients with gingivitis, periodontitis or periodontosis was studied. The teeth were extracted by a special technic which left all the periodontal tissues attached to the removed tooth. The distribution of alkaline phosphatase in the decalcified tissues was determined by Gomori's technic by which the tissues are incubated with sodium glycerophosphate at a pH of 9.2 for 30 minutes, 3 hours or 24 hours.

The amount of alkaline phosphatase in the normal gingiva is slight. The enzyme is distributed in moderate amounts only in the blood vessels of the corium and in the basal layer of the epithelium. The amount of the enzyme is greatly increased when inflammation occurs attended by new formation of collagen fibers and production of cemental or osseous lamellae for insertion of the fibers.

When the gingival sulcus is transformed into a periodontal pocket, large amounts of alkaline phosphatase are found in the granulation tissue of the lateral wall and of the bottom of the pocket, the gingival fibers at the point of their insertion, beneath the pocket and the cemental surface beneath the gingival fibers. The zones of phosphatase activity in the inflamed tissues of the pocket and of the gingival fibers may be either continuous or separated by an area of tissue free from inflammation and devoid of the enzyme.

The alkaline phosphatase contained in the periodontal membrane is located in the surfaces of the cementum and bone. The alveolar bone has large amounts of alkaline phosphatase only in the alveolar crest and in certain zones of its periodontal and periosteal surfaces. The increase of phosphatase in inflamed periodontal tissues indicates a metabolic reaction of the enzyme against the tissular changes caused by inflammation. When it is located in the gingival fibers it indicates new formation of collagen fibers. When it is located simultaneously in the gingival fibers and their cemental fibers and in the zones of phosphatase activity of the periodontal membrane, the enzyme reveals its presence by the new formation of both collagen fibers and cemental or osseous lamellas for insertion of the fibers. The presence of alkaline phosphatase in certain zones of the alveolar bone is always correlated with osteogenesis.

**Effects of occlusal variation
on the periodontal tissue**

Anthony F. Posteraro. *Ann. Den.*
14:80-83 Sept. 1955

All branches of dentistry are based on the science of occlusion. An occlusion is functionally normal when the occlusal relationship of opposing teeth in all excursive movements provides the greatest masticatory efficiency without causing an undue strain or trauma. Any variation in the normal occlusion will result in an abnormal occlusal state with consequent changes in the clinical, microscopic and roentgenographic pictures. In instances of malocclusion in which one or more teeth cannot be brought into contact with their antagonists in any position in which the mandible

is moved, an extrusion of the tooth, an increase in thermal sensitivity, and a loss of gingival tone may be evident clinically. The periodontal membrane becomes less dense and degenerates. This indicates that the thickness of the periodontal membrane in each jaw is in direct ratio to the intensity of mastication. A localized osteoporosis may develop because of the lack of stimulus to form new bone. Traumatic occlusion creates an abnormal occlusal stress which is capable of producing an injury to the periodontium. In young patients and in those older patients where the resistance of the supporting tissues is high, the incipient signs are not often found. In any debilitating illness or in any lowering of the resistance of the individual, the effects of an abnormal occlusal state on the periodontal tissues may be found. Box has recorded approximately 20 signs of periodontal disease; in most instances, these manifestations are the result of traumatic occlusion. Photographs and roentgenograms illustrate the effects of occlusal variations on the periodontal tissue.

A problem of periodontics and of prosthesis:

Apparatus supported by teeth and gingival mucosa (Un Problema de la Periodoncia y la Protesis: Los Aparatos Dento-mucosos Soportados)

Oscar A. Lambruschini. *Rev.lat.-amer. periodont.* 4:6-10 Jan.-June 1955

In all instances in which lost maxillary teeth are replaced by a prosthesis supported by the remaining teeth and the ridge of the gingival mucosa, a lack of uniform mastication results. This lack is due to: the exaggerated mobility of the saddle; the rigid stability of the anchoring teeth; the differences between the depressibility of the abut-

ment teeth and the mucosa; the uneven load of the prosthesis on both; and the direction of force from the base to the anchoring teeth. For this type of prosthesis the following facts should be kept in mind:

1. A prosthesis with a base having neither clasps nor attachments is not sufficiently stable and does not permit efficient mastication. It should be used only in exceptional cases.

2. A prosthesis with a base permanently fixed to the remaining teeth by means of rigid clasps or attachments harms the periodontium of the clasped teeth. Its use should also be exceptional.

3. A prosthesis with a base united to the remaining teeth by flexible bars is the best. It includes: the simple flexible connector that joins clasps or attachments from the prosthesis to the retainer, the old and new Beat Muller's devices and the stress-breakers, which are mechanical devices of great value.

The simple joint type of stress-breaker places the load of the prosthesis on the teeth rather than on the mucosa. The nonrigid stress-breaker and the joint type of stress-breaker that attaches to the base by means of nonrigid links distribute the forces evenly on the teeth and on the mucosa. Nonrigid stress-breakers consist of flexible bars that transmit elastic force from the prosthesis to the abutment teeth. The direction and point of application of forces acting on the anchoring teeth can be favorably modified by their use. Nonrigid stress-breakers should be as flexible as possible. The degree of flexibility depends on the material used in their construction and the length of the device. They can be either forged or cast. The author uses cobalt and chrome cast stress-breakers. Although they are more rigid than the forged ones, they give greater stability to the lateral bases. The technic is simple, and they maintain the bases in perfect functional condition.

Orthodontics



Orthodontics

Evaluation of surgical and orthodontic therapy

(Zur prognostischen Beurteilung chirurgisch-orthopädischer Eingriffe)

H. Gerlach, Jönköping, Sweden.
Fortschr.Kief.Ges.Chir. 1:231-237 1955

Severe disharmonies in the oral cavity such as prognathism, characterized by a considerable projection of the jaw (a gnathic index of above 103), usually accompanied by "open bite," occur mainly in older persons. This anomaly conventionally belongs in the field of oral surgery. Because of the advanced age of most patients, however, every instance of prognathism appears to be an equilibrium between form and function which can be disturbed by all surgical procedures. Therefore, it is necessary to evaluate immediately the degree to which functional dynamic forces oppose any newly formed balance. The main technical problem is how to safeguard the recently obtained equilibrium until the function will be able to adjust. Reports of relapse after oral surgery prove, however, that the worn-out human organism has only a limited ability of readjustment.

For several reasons, especially psychological, the correction of anomalies in the oral cavity should be undertaken when the patient is young. An evaluation should be made whether orthodontic treatment alone or the combination of orthodontic and oral surgical therapy will be required. The indication should not be limited or influenced by the estimation of the symptoms present but should take into consideration the nature of the relationship between form and function in the different structural elements of the masticatory system.

The analytic determination of these forms and functions should consist in a clinical study of size,

tonus, condition and position of the tongue, the masticatory muscles, the mimetic habits, and the movability of both jaws; and the formal and final analysis of existing relations between size and condition of both jaws. Only in such a manner can the individual developmental tendencies be evaluated correctly. The relationship between Brodie's plane, the anterior nasal spine and the lower jaw, the index of the mandibular rami and the developmental stage of the premaxilla must be investigated thoroughly.



Figure 1 Open bite before treatment



Figure 2 Open bite after treatment

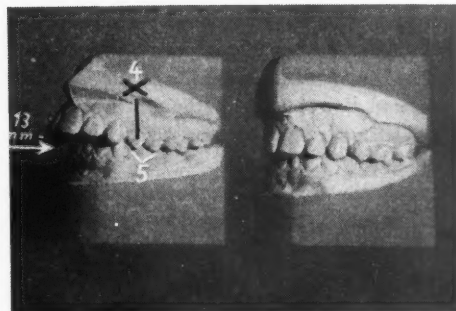


Figure 3 Left: Open bite before treatment. Right: After surgical and orthodontic treatment

Even seemingly minor divergent factors can produce fundamental alterations in the prospect of a successful therapy. Morphologic and functional connections between the involved parts of the masticatory system also can influence both the prognosis and the method of treatment.

The role of the orthodontist will be that of a co-worker in a reconstructive program. Diagnostician, oral surgeon, prosthodontist, psychologist and orthodontist will share jointly in planning and carrying out the patient's rehabilitation. This is a desirable arrangement, because each specialist can contribute his share to the progress and will be aware constantly of the work of the others.

Orthodontic surgery in impacted teratologic accumulation: report of case
(Intervention chirurgico-orthodontique sur un amas teratologique inclus)

Mme. Tacall. *Rev.franç.odontostomat.* 2:456-462 June-July 1955

In dental literature, only a few instances have been reported of impacted teratologic accumulations appearing in the place of missing teeth.

The patient, a ten and a half year old boy, exhibited, instead of the missing left central incisor, a compact teratologic mass near the *spina nasalis posterior ossis palatini*. The accumulation of teratologic matter was surgically drawn toward the dental arch, then divided into smaller parts and removed. Roentgenograms revealed that below the teratologic mass an unerupted tooth was impacted in which decalcification had taken place.

The extreme curvature of the impacted tooth root made removal of this tooth difficult. The left side of the jaw was opened with a buccal flap, under local anesthesia, and finally the impacted tooth and the remains of the teratologic mass were removed. The flap was sutured back into place.

During the next session, a vital molar, which was involved in an inflammatory process, was extracted. A vital incisor, perfect in appearance, which had been preserved in a tooth bank, was implanted and placed in correct position, supplanting the missing upper left central incisor. The postoperative course was normal.

After difficult orthodontic treatment, which was continued for several months, the patient's dental arch presented no sign of the previously distorted feature caused by the anomaly.

This daring attempt in oral surgery and orthodontic therapy seems to eliminate the word "impossible" from dental terminology.

**Prophylaxis
in maxillofacial orthopedics**

(Alcuni aspetti della profilassi nella ortopedia maxillo-facciale)

A. Maggioni. *Riv.ital.stomat.* 10:765-780 July 1955

In many branches of dentistry, especially in the field of maxillofacial orthopedics, conservative procedures accomplish more than does the treatment of abnormal and diseased conditions. Unfortunately, malocclusions occur so frequently that the major efforts in orthodontics must be directed toward correction rather than toward prevention.

Earlier research seemed to indicate that the effect of orthodontic therapy was limited to the alveolar region. This may be true in strict orthodontic movement. As investigation has progressed, more possibilities appear for an early intervention in the developmental processes.

The upper and lower jaws are suspended from different regions of the cranial base, and it is only their developmental pattern which allows both to grow harmoniously. If a malocclusion occurs, possibly as a result of an early tooth loss, it is possible to correct the anomaly during the developmental period by maxillofacial orthopedics. After conclusion of this therapy, the orthodontist has to make the best of the "empty spaces" left by unavoidable extractions. Trends in the timing of orthopedic treatment have changed according to the changes in concepts.

The inherent developmental pattern in many young patients was able to fulfill its potentiality. Malposed teeth in some patients often correct themselves spontaneously because of the inherent developmental pattern. In other patients, however, the malocclusions become so severe that the ideal pattern cannot develop without surgical

elimination of the obstacles. Depending on the condition, conservative and curative extractions of deciduous and permanent teeth are performed, and either serial extractions (Kjellgren's method) or the enucleation of dental germs (Wongtschovsky's technic) is practiced.

Frequent relapses after both methods of treatment are disappointing to orthodontists, parents and patients. Of course, these technics should be understood and performed according to the rules and limitations described by their authors.

The great difference in results obtained by pure orthodontics and maxillofacial orthopedics should be understood, to avoid or restrict to the minimum the damage, especially in esthetics, which follows either irrational procedures or hasty mutilations.



Growth and development

The significance of early loss of deciduous teeth in the etiology of malocclusion

Anders Lundström, Stockholm. *Am.J.Orthodont.* 41:819-826 Nov. 1955

The relationship between premature loss of deciduous teeth and subsequent crowding of the teeth, as reported by the author and by other investigators, is reviewed.

It is particularly the earlier extractions at seven or eight years of age that contribute to the development of crowding. Even in such instances, normal spacing conditions eventually may be obtained. The reduction in normal spacing for the whole dental arch after extractions at seven or eight years appears to be about 22 per cent in the upper arch and 13 per cent in the lower. Otherwise expressed, it appears that about a third of the patients develop crowding in the maxilla and about a fourth in the mandible as a result of such extractions.

A study was made of the effect of mandibular extractions on overbite and overjet. No significant increase of these characteristics could be demonstrated.

The early loss of deciduous teeth has no general influence on the development of the dentition. In spite of extensive and early loss, the end result may be normal. The loss of space seems to be moderate in a great many instances. In some, however, a manifest and possibly a permanent effect is observed. There may be several causes for this difference. The specific deciduous teeth lost constitute one important factor. Breakspear has shown a considerable difference between the loss of the second and the first deciduous molars, the closing of the space being more rapid and more complete in the former than in the latter instance. The migration was also larger in the maxilla than in the mandible.

Another circumstance that contributes to the variations in migration is the intercuspitation. This may prevent the first permanent molar from drifting forward. The eruption to contact of the upper and lower first molars is an important phase in the development of the dentition. Until the first permanent molars have erupted, there is nothing but the presence of the permanent bicuspid germs to prevent the forward drift of these teeth. There is a considerable variation in the vertical position of the second bicuspids, at the same age. This variation could influence the forward drift of the first molars and thus may account for some individual differences in the development of the malocclusion after early loss.

Probably the relative arch spacing is the most important cause of differences in reaction to premature extraction. If there is a tendency to fairly large jaws, with normal spacing of the teeth or perhaps a slight overspacing, it is possible that extraction will have no influence at all. On the other hand, if there is a tendency to crowding and there is a certain amount of contact pressure between the teeth, an extraction probably can quite often produce a permanent closing of space, even in the total perimeter of the dental arch.

Basic science



Anatomy

The teeth of vertebrate animals

(Über die Zähne der Wirbeltiere)

W. Jungkunz. *Deut.zahnärztl.Ztschr.*
10:1341-1347 Oct. 15, 1955

The relative role and importance of hereditary and environmental factors in the tooth development of vertebrate animals are an interesting subject to most dentists since the ontogenic evolution of various forms of animal teeth may have a bearing on that of human teeth.

In vertebrate animals, several specific and determinable differentiations of the dermal development are observable. The skin may consist of horny layers of the epidermis (stratum corneum) alone, or of subcutaneous connective tissue (cutis) alone, or of both combined. These tissues also form scales, dermal bones, antlers, horns, claws, hoofs, nails, hair, feathers and teeth.

The placoid scales, as appear in *Selachii* and *Cacharodonts* (sharks), are the starting points of tooth development. The surface of these pseudo teeth consists of dentin covered by adamantinelike structures (durodentin) but not true enamel.

The typical animal tooth has the same organic structure and ontogenic development as the placoid scales of the shark. The primary phase is the maturing of the cutis papilla into which later the odontoblasts migrate. These cylindrical connective tissue cells form the outer surface of the pulp adjacent to the dentin, and are connected to each other by protoplasmic processes.

There are animal teeth which consist solely of

dentin, but in many instances the basal cell layer which produces the mucous membrane also produces a thin layer of enamel. In more complicated teeth, the cementum surrounds the root dentin. Dental germs develop similarly to placoid scales. In most vertebrate species, the teeth erupt into dental rows. The lamina proliferates into the connective tissue, and the bell-shaped dental germs develop in the thickened ridge of the epithelium along the edges of the gum. The whole oral structure then is overgrown by apophyseal processes of the jaws, anchoring the erupted teeth with their roots inserted in the alveoli.

The term "homodont" characterizes teeth similar in form and type; "heterodont" indicates teeth of different shapes and kinds such as incisors, cuspids, premolars and molars. The dental lamina is not always limited to an upper and a lower jaw as in mammals. Cartilaginous and teleosteous species of fish, amphibians and several types of snakes have teeth developed on the vomer, the

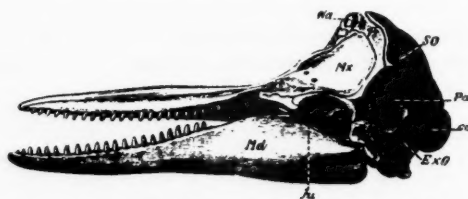


Figure 1 Skull of the dolphin

palatal, parasphenoid and other bones of the skull. Teeth even develop on the tongue.

To the primitive vertebrate animals belong the species of *Cyclostomata* (lamprey and hagfish), which have neither jaws nor true teeth. Isolated horny toothlike structures appear in the oral cavity and are shed periodically.

The *Selachii* (types of elasmobranch fish) have large placoid toothlike scales on the edge of the mandible and the palatal quadrate which appear in several rows. When the anterior row is worn out, it is replaced by the next row. These toothlike formations are anchored in the connective tissue. Some species are homodont, other categories are heterodont.

The *Ganoidei* (sturgeons, paddlefish and several extinct species) and *Teleostei* (types of bony fish) have teeth on nearly all bones in and around

the oral cavity, the visceral arch and on the tongue. The majority are heterodont.

In *Dipnoi* (types of lungfish), the enamel-free teeth are fused into large dental plates with ramified tubular pulp cavities.

Batrachia (amphibians) have cone-shaped teeth, appearing directly below the mucous membrane.

Several species of reptiles and some fish classes have their teeth attached to the ridges of both jaws instead of being inserted into alveoli (acrodont teeth). Most types of lizards and nonpoisonous snakes have teeth which are laterally consolidated with the inner edges of the jaws (pleurodont teeth).

Turtles and tortoises have no teeth but horny crests on both jaws.

Alligators and crocodiles have cone-shaped teeth inserted into alveoli (thecodont teeth).

Venomous snakes have replaceable poisonous fangs either hollowed like hypodermic needles, folding back against the roof to be erected only in striking and piercing (solenoglyphic fangs), or they have permanently erected fangs, located in the anterior part of the upper jaw with an open or an almost closed groove (proteroglyphic fangs).

All bird classes of the present period have no true teeth. Extinct species such as *Odontornithes* (*Odontolcae* and *Odontormae*), however, were provided with true teeth.

In mammals, the teeth are always inserted into alveoli. As in man, deciduous teeth first erupt, to be later replaced by permanent teeth. In some instances, however, both dentitions fail to develop during the embryogenic stage, as in duck-bills and right whales.

Elephants have a nearly unlimited substitutional dentition.

Most higher species of vertebrate animals, especially all classes and subclasses of *Mammalia*, have multiple tooth types.

Invertebrate animals sometimes have toothlike structures but never true teeth.

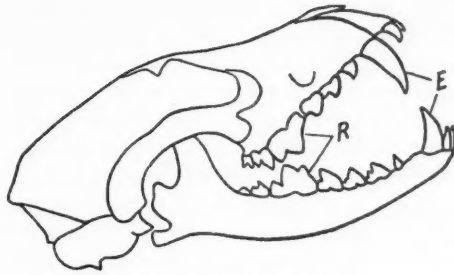


Figure 2 Skull of the wolf

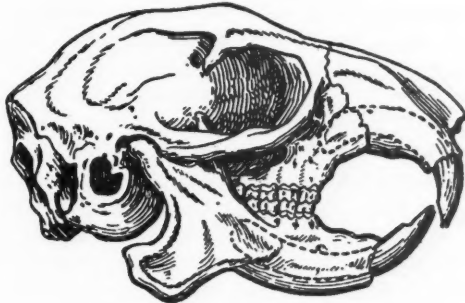


Figure 3 Skull of the squirrel

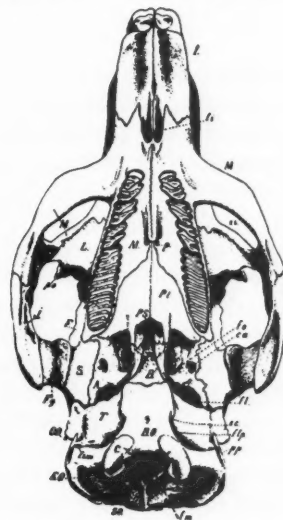


Figure 4 Skull of the water hog



Physics

The crystal structure of dicalcium phosphate, CaHPO_4

G. MacLennan and C. A. Beevers. *Acta. cryst.* 8:579-583 Sept. 1955

A complete structure determination of this compound by methods of roentgen-ray diffraction is described. The possibility of a continuous series of solid solutions between hydroxyapatite and this substance is shown to be unlikely.

Anhydrous dicalcium phosphate has a space group $P\bar{1}$ (triclinic) with:

$$a = 6.90 \pm 0.01, b = 6.65 \pm 0.01,$$

$$c = 7.00 \pm 0.01 \text{ \AA}; \alpha = 96^\circ 21',$$

$$\beta = 103^\circ 54', \text{ and } \gamma = 88^\circ 44'.$$



Histopathology

A histopathological study of the bacterial plaque in relation to the destruction of enamel, dentin and bone with special reference to dental caries (condensed)

J. J. Hodson. *Proc. Roy. Soc. Med., Section of Odontology.* 48:641-652 Aug. 1955

An attempt is made to clarify the interpretation of the histopathologic picture of the caries lesion, particularly in the enamel. Observations on the bacterial plaque are made and an outline presented of certain histologic appearances of the destruction of the enamel, dentin and cementum. Correlations are presented between these appearances and those in two instances in which bacterial penetration of the enamel, in one instance, and of the enamel, dentin and bone, in the second instance, occurred under conditions different from those usually associated with dental caries.

Dental caries is primarily an acid demineralization of the teeth caused by bacterial degradation of environmental carbohydrates. There is no

indication that caries may, under certain conditions or in certain regions, be proteolytic in origin.

In the enamel, the evidence shows that the bacterial invasive phases are largely in sites of fracture and dislocation of the enamel rods caused by trauma and by forces associated with the demineralization process, such as gas and shrinkage. Support for these views is found in two instances, one showing infestation of cracks extending from a carious lesion in an infected unerupted tooth, and the other showing bacterial infection of exposed developing teeth and bone associated with severe external and occlusal trauma (manual and tooth grinding). The similarity of the enamel lesions in this instance to those in the bacterial penetration stage of caries seems significant.

The strengthening of the fragile enamel matrix by the consolidation process after some demineralization is a slow process. Bacteria do not seem easily to penetrate demineralized consolidated rods in caries regions. In acute caries with rapid demineralization and spread of bacteria in extensive tracts, the entry of organisms into the open "reticulum" of the rod, and infestation of collapsed and fractured matrix, offers a more likely explanation than lysis of the highly resistant keratin.

The belief that immature enamel is more susceptible to bacterial penetration and proteolysis is not supported. Indeed, bacteria do not appear to enter highly immature matrix, but enter sites of fractures and developmental defects.

Effect of lactate buffers on dental enamel in vitro as observed in polarizing microscope

E. Hals, T. Mörch and H. F. Sand. *Acta odont. Scandinav.* 13:85-122 Aug. 1955

Carious defects in the enamel may result either from removal of the minerals or from destruction of the organic matter. The usual appearance of caries is a macroscopic defect with loss of both inorganic and organic substance.

No definite proof has been produced to establish whether the initial lesion is caused by loss of inorganic matter by acid, or whether this process is secondary, made possible by a preceding attack on the organic elements.

Lactate buffer solutions, pH 3.51 to 5.70, of constant ionic strength were applied in wax tubes on extracted, newly erupted bicusps using the Brudevold technic. After 12 minutes to 12 days exposure times, ground sections of the experimental regions were examined in polarized light.

Two main types of defects were observed:

1. Inner spots were macroscopically opaque with a shiny intact surface. Microscopically they showed a surface layer where negative birefringence was retained. Inside this layer the real defect was found, as a positive central area with isotropic border zones. Inner spots only occurred when buffers with pH from 4.12 to 5.25 were used and only after short exposure. They resemble hypomineralized zones in enamel and incipient caries.

2. Outer spots appeared at pH below 4.12 and above 5.25 and after longer exposure when buffers with pH 4.12 to 5.25 were used. Macroscopically the outer spots appear as whitish, dull regions with or without loss of substance showing positive birefringence in the external zone of the enamel, separated by a narrow isotropic zone from the intact enamel.

The various phases of decalcification observed could be deduced from the development of the inner spot.—G. Ryge

▼

Psychology

Dental psychology

J. C. Theriault. *J. Canad. D.A.*
21:565-570 Oct. 1955

The word "teeth" is commonly used to express aggression and determination, as in such phrases as "sinking your teeth into a job," "gritting your teeth," "cleaning your teeth," "showing your teeth," and "knock your teeth out." Teeth also seem to be symbols of beauty, judging from various tooth paste advertisements. Originally, teeth were used to attract the opposite sex, for eating and for self-defense. The loss of teeth is a threat to one's ability to defend himself, a threat to

one's self-esteem, and may precipitate a hidden anxiety concerning castration. The loss of teeth may also symbolize the loss of strength and virility, and a possible alteration in one's appearance. The wearing of dentures and the loss of teeth are signs of old age. Unhealthy and erroneous attitudes developed in childhood toward dentistry are often at the root of poor oral hygiene.

If the dentist is to be considered by the populace as more than a mechanic, he must become known as one who treats not teeth but people who need dental care. Dentists should heed Plato's admonition: "For this is the great error of our day that physicians separate the soul from the body."

Children at around the age of three should begin to visit the dentist. It is desirable that such visits be made before painful procedures have to be undertaken. The child or person who fears the dentist has as an opposite number the person who is all too amenable to the idea of losing teeth—or tonsils, appendixes and sinuses, too. Such persons are motivated by a desire to sacrifice their organs as a means of ridding themselves of guilt.

The dentist occasionally may see a patient who expresses delusions relating to some part of the body. It is important to evaluate such a patient and to refer him to a psychiatrist for help. In the use of hypnosis in dentistry, caution should be exercised in the choice of patients. The type of person most amenable to hypnosis is usually the suggestible type and very often the hysterical type. The dentist using hypnosis on women patients should have a nurse or other suitable witness always present in the room.

The dentist must be interested in more than the patient's teeth if he is to merit the name of doctor and if he is to take his proper place in the field of health.

Placebo

Louis Lasagna. *Scient.Am.* 193:68-71 Aug. 1955

Pioneer studies on the personality differences between those who react to placebos and those who do not are reported. Of 162 patients at the Massachusetts General Hospital, all of whom had just undergone operations and were suffering pain,

some were given morphine and some placebos when they requested something for pain. More than half of the patients reacted to the placebo, and a few reported that their pain disappeared completely. The patients responding to placebos also were more apt to be relieved by morphine than were the nonreactors.

In an effort to determine possible psychological differences between reactors and nonreactors, 27 subjects were selected, one group composed of those who had reacted to the placebo every time and the other of those who had never reacted. Neither sex nor age was significant. All subjects were interviewed and tested by two clinical psychologists. The average I.Q. scores of both groups were found to be identical. Among the differences that appeared in the interview data and in response to the Rorschach inkblot personality test were the following: Reactors averaged two years less formal education than nonreactors; reactors were happier about their hospital experience and tended to minimize postoperative discomfort; reactors were more cooperative and slightly more concerned about themselves; two thirds of the reactors acknowledged a tendency to develop somatic symptoms under stress; more "weepers" and "talkers" were discerned among reactors; every reactor was active in church affairs; reactors were more anxious and less hostile than nonreactors and seemed more dependent on outside stimulation than on their own mental processes, which tended to be immature. Reactors frequently responded to the inkblot test with references to the pelvic and abdominal viscera. The study seems to support the notion that there are personality characteristics and habits of mind which predispose a person to respond to a placebo.

Some psychiatric aspects of management of the dental patient

Steven Hammerman. *J. Connecticut D.A.*
29:14-17 Aug. 1955

All dental patients are anxious, whether this anxiety is evident overtly, whether it is admitted by the patient or whether he is unaware of the existence of the anxiety. The person who has retained an excessive amount of narcissism (self-love) will

have considerable anxiety at the threat of possible damage or injury to his own unconscious conception of his body image. Such persons may make excessive demands on the skill, patience and capability of the dentist.

A second major basis for anxiety in the dental patient relates to unconscious conflicts revolving around the specific region of the operative field, the mouth. Many persons remain excessively fixated at the oral stage of development. The dentist must be aware of the origins of anxiety in his patient in order to handle him properly.

Among the conscious and unconscious defenses which the ego of the dental patient may utilize are the following: (1) modification of the external situation in accordance with the person's own will, expressed by attempting to reach an agreement with the dentist that the patient will control the duration of such dental activity as drilling; (2) identification with the aggressor, wherein the patient attempts unconsciously to identify himself with the dentist; (3) denial of reality, in which the patient has fantasies of himself in another situation in an attempt to deny the reality of the current pain, and (4) the use of hostility to deny the anxiety, manifested by the patient's threatening the dentist, either playfully or more openly, that if any pain is caused he will leave immediately or will be angry with the dentist.

The dentist may utilize various technics to alleviate both general and specific anxiety in the patient. General technics include reassurance, encouragement, persuasion, warm acceptance of the patient, and adequate explanation of procedures. These tend to strengthen the patient's ego. Specific technics include allowing the patient frequent interruptions so that the latter may feel he is retaining active control of the situation, enhancing the patient's identification with the dentist by discussing mutual friends or matters of common interest, and encouraging mild hostility of the patient. If the dentist is aware of his own anxieties, he will be more able to accept the anxiety and hostility of the patient without becoming secretly hostile. If the dentist is unable to control his own anxieties, he will be unable to tolerate anxieties in the patient, thus increasing the patient's anxiety and alienating him from the treatment.



Physiology

The relationship between dentin sensitivity and movements in the contents of the dentinal tubules

Ivor R. H. Kramer. *Brit.D.J.* 98:391 June 7, 1955

Many stimuli will cause pain when applied to exposed dentin, but the mechanism involved is not known. The "hydro-dynamic" theory has been proposed to explain dentin sensitivity in the supposed absence of nerves. Dentinal tubules contain fluid or semifluid material, and their walls are relatively rigid. In the hydrodynamic theory, it is suggested that peripheral stimuli are transmitted to the pulp surface by movements of this column of semifluid material within the tubules. The author reports observations which suggest that dentin sensitivity cannot be explained in terms of the movement of tubule contents.

In 1952 Kramer and McLean reported that in noncarious teeth filled with unlined self-curing acrylic resins, odontoblasts or odontoblastic nuclei were often seen to be aspirated into the dentinal tubules opened during cavity preparation. Aspiration was found to occur with all eight resin materials tested when the cavities were unlined, although it did not occur in every tooth so filled. Of 152 teeth treated in this way and examined histologically, 41 showed aspiration. Careful records were kept of the occurrence of pain during the insertion of the filling and during the period between filling and extraction.

The incidence of pain has been compared with the incidence of aspiration of cells into the dentinal tubules. Only nine teeth showing aspiration had also caused pain, whereas pain was experienced from 21 teeth showing no aspiration. There were 32 teeth showing aspiration which had caused no pain. Lack of correlation between the incidence of this disturbance and pain experience would seem to provide definite evidence that dentin sensitivity cannot be explained in terms of movement of tubule contents. Inflammatory changes were present in the pulps of all the teeth that had caused pain.

A study of the nerve supply to the upper anterior teeth

Norman H. Olsen, George W. Teuscher and Karl L. Vehe. *J.D.Res.* 34:413-420 June 1955

To determine the source of innervation to the upper anterior teeth, 26 specimens were dissected. The anterior superior alveolar nerve arises from the lateral or inferolateral aspect of the infraorbital nerve, the point of origin varying from the anterior portion of the canal to midway anteroposteriorly in the canal. The origin point depends on the number of branches arising from the infraorbital nerve to form the anterior superior alveolar nerves. The number of these branches varies from one to three. The anterior superior alveolar nerve passes in the bony canal of Wood or Jones until it reaches the anterior aspect of the maxillary bone. The diameter of the nerves innervating the teeth is smaller than the diameter of those of tactile sensibility innervating the mucous membrane and interseptal tissue. The nerves arising from the main branches of the anterior superior alveolar nerve vary from sparseness to a dense, complex configuration. The middle superior alveolar nerve was absent in 53 per cent of the specimens dissected. When this nerve is absent, the superior dental plexus is formed by the anterior and posterior superior alveolar nerves. When this nerve is present, the plexus is formed by the anterior, middle and posterior superior alveolar nerves. The nerve approximates the region of the apexes of the teeth that were removed prior to the death of the subject. The nerve supply to the upper anterior teeth is derived from filaments arising from the anterior superior alveolar nerves or filaments from the superior dental plexus.

The clinical significance of the ridge of Passavant

Richard Thomas Barton. *Surg., Gynec. & Obst.* 101:317-320 Sept. 1955

In 1863 Passavant first described the anatomic structure now known as the ridge of Passavant. Since that time this fold has been almost completely ignored by laryngologists, speech ther-

apists and plastic surgeons dealing with cleft palate deformities. This fold is described in detail, laboratory and clinical observations regarding it are reported and its importance in cleft palate surgery is considered.

The ridge of Passavant is a transverse fold of the posterior pharyngeal wall, which develops during speech, swallowing, retching, vomiting, or whenever it is necessary to shut off the nose from the mouth. It is linear, pencil-sized in the adult, and located a few millimeters below the base of the uvula. It extends across the entire breadth of the posterior pharyngeal wall, including the raphe. On phonation, it is elevated to the level of the atlas. The ridge of Passavant is an important physiologic component of the nasopharyngeal sphincter. This structure is formed in the mucosa of the posterior pharyngeal wall as a result of the active constriction of the upper and inner horizontally disposed fibers of the superior constrictor muscle.

The nasopharyngeal sphincter is formed by the levator muscles pulling the palate upward and back, by the palatopharyngeus muscle pulling lateral pharyngeal walls inward, and by the ridge of Passavant bulging anteriorly from the posterior pharyngeal wall. Because of the ridge's importance in articulation and deglutition, this region should be subjected to a minimum of trauma if postoperative speech and swallowing difficulties are to be avoided. The teaching of surgical anatomy must be altered to include the new anatomic concept of the ridge of Passavant.



Pathology

Stomatitis

Kenneth S. Oliver. *Surg.Clin.N.A.*
35:617-627 June 1955

Inflammatory lesions of the mouth are among the lesions most frequently encountered in medical and surgical practice. They occur at all ages and in persons with all degrees of bodily health from the robust to the cachectic. The lesions may be mild or severe, acute or chronic, localized or dif-

fuse. They may present a bewildering variety of clinical pictures, and attempts to diagnose or classify them on a descriptive basis are rarely rewarding. In each instance clinically encountered, the attempt must be made to determine the etiological factors concerned. Although this attempt is not always successful, the instances of obscure etiology become constantly fewer. Similarly, any general consideration of stomatitis must be based on etiological factors.

Bacterial infections

Stomatitis caused by bacterial invasion may show erythematous, membranous or ulcerative lesions anywhere in the mouth. The regions most commonly affected are those adjacent to the tonsil and those where infection is facilitated by the irritation of rough or poorly kept teeth and dentures. Patients suffering from this type of infection will frequently have, in addition to the discomfort of local lesions, a foul breath and a constitutional reaction of malaise, fever and leukocytosis. There may also be secondary cervical adenitis or extension of infection into the salivary glands.

The diagnosis of bacterial stomatitis is dependent on both clinical observation and laboratory studies. Darkfield studies may be called for in suspected syphilitic lesions and biopsy in tuberculous or other doubtful ulcers and granulomas. Cultures for antibiotic sensitivity of the organisms frequently will indicate the most effective therapy. With this information available, the antibiotic or antibiotics of choice should be used energetically and continued for some days after subsidence of active symptoms. The occasional patient with posterior stomatitis with adherent membrane should receive early and generous administration of antidiaphoretic serum while laboratory studies are being carried out.

Virus stomatitis

In many instances of acute or chronic stomatitis, cultures fail to demonstrate the presence of any significant bacterial growth. When there is also failure to improve on antibiotic therapy, it may be suspected that a virus is the causative agent. Proof of it is commonly difficult to obtain.

The virus most frequently implicated in lesions of the lips, buccal mucous membrane and tongue is that of herpes simplex. An acute form frequently seen in children apparently represents an initial infection. In this form vesicles may appear in a number of places in the mouth. These soon ulcerate, and the ulcers may coalesce to form extensive, painful lesions. They may be accompanied by foul breath, cervical adenitis and a sharp constitutional reaction. A chronic form is seen in persons who harbor the infection and suffer from recurrent lesions, characteristically in the form of the "cold sore"; they may also show vesicles which proceed to shallow ulcerations in the mouth, the nose, more rarely on the genitalia or the eyes. There is no constitutional reaction, however.

Aids to clinical observation in the diagnosis of the herpes simplex stomatitis comprise, first, the inoculation of material from the lesions into the rabbit's cornea. Vesicles leading to ulceration result, and characteristic inclusion bodies may be seen in corneal scrapings. A second method is by the demonstration of complement fixation to herpes virus during the course of an attack and convalescence.

Treatment of this condition is mainly symptomatic. Repeated vaccination is believed by many to reduce the tendency to recurrent episodes.

Stomatitis due to fungus

The commonest form of fungus stomatitis is that due to monilia or *Oidium albicans*, popularly known as "thrush." Predisposing conditions are malnutrition, poor oral hygiene, the use of penicillin (especially locally) and chronic hypoparathyroidism. The lesions show patches of pearly gray pellicle, which are easily separated from their attachment and which leave a shallow abrasion of the underlying mucous membrane. Clinical diagnosis may be confirmed by examination of scrapings in a 10 per cent potassium hydroxide hanging drop. Cultures grow well on Sabouraud's or Loeffler's medium. Treatment calls for correction of all faulty hygiene and for general supportive measures. Local application of 1 per cent aqueous solution of gentian violet several times a day usually causes prompt disappearance of the lesions.

Stomatitis due to deficiency disease

Prolonged or severe malnutrition is a frequent cause of stomatitis and glossitis. This is primarily a true deficiency disease, but secondary bacterial invasion often follows and complicates the clinical picture. The lesions most frequently seen are those due to deficiency of components of the vitamin B complex, especially riboflavin and nicotinic acid. Riboflavin and thiamine avitaminosis is responsible for the multiple lesions of beriberi, which include multiple neuritis. Nicotinic acid deficiency, together with an insufficiency of other vitamin B complex elements, is the cause of pellagra. The lesions of scurvy, which are due to severe lack of vitamin C, involve principally the gingiva. Fortunately, this dire disease, formerly the scourge of the seafaring population, is now rarely encountered. In pernicious anemia there is frequently an early complaint of soreness of the tongue. Sprue is a condition of unknown etiology, in which the mucosa of the entire alimentary tract shows atrophic changes.

The diagnosis of the deficiency diseases must be based on a thorough history, physical examination, hematological, biochemical and other appropriate studies. In general the avitaminoses, as well as the less specific malnutritional states, can usually be controlled by a judicious selection from or combination of liver extract, folic acid, vitamin B complex and vitamin C.

Stomatitis due to blood dyscrasias

In leukemia the oral changes are early and prominent, particularly in the acute types. The gums are swollen and hypertrophic, with considerable tendency to bleeding. Ulcerations may occur anywhere on the buccal mucous membrane. Clinically similar ulcerations are seen in agranulocytosis, in which secondary infection is usually rapid and severe. Hemophilia and purpura, both of the symptomatic and thrombocytopenic types, show all stages from small petechiae to severe bleeding into and from the mucous membranes. In all these conditions, careful history taking is mandatory, together with adequate blood and general studies. Local intervention without such evaluation has too often led to tragic terminations.

Stomatitis due to allergic conditions

Aphthous stomatitis has been shown to be, in some instances at least, caused by allergic factors, particularly food sensitivities. The lesions show first as vesicles, which progress to shallow, punched out ulcers covered with grayish exudate and surrounded by a narrow zone of hyperemia. They are usually painful, sometimes sufficiently so as to interfere with proper nutrition. Another local manifestation of allergy is angioneurotic edema, a swelling of rapid onset, which may affect any part of the mouth from the lips to the glottis. In the latter location the edema may rapidly endanger life, and prompt administration of epinephrine and an antihistamine is urgently indicated; tracheotomy is sometimes necessary.

Stomatitis due to traumatic, thermal and chemical factors

Bacterial invasion is favored by the irritation of poor oral hygiene, cheek chewing, rough teeth, ill-fitting dentures and chemical burns. Leukoplakia must be considered, potentially at least, as a precancerous condition. Stomatitis may follow the administration of the heavy metals, such as bismuth, mercury and occasionally gold.

Miscellaneous forms

Some forms of stomatitis are associated with generalized dermatoses, among which may be mentioned pemphigus, erythema multiforme and lichen planus. There is nonspecific ulcerative stomatitis in which recurrent painful ulcerations of the mouth and pharynx occur, with intermissions, over long periods of time. These ulcerations may lead to cicatricial deformities of the palate and pharynx, and complete destruction of the epiglottis is sometimes seen. Antibiotics, particularly chlortetracycline, have been claimed to be beneficial, but their effect is only temporary and palliative; the tendency to recurrence is not significantly affected. Among other lesions, Fordyce's disease and black hairy tongue may be mentioned. Both are of no specific etiology and no treatment is indicated.—*Alexander F. Baranoff*

Cooley's anemia: its dental aspects

(Aspetti odontostomatologici del morbo di Cooley)

B. Ventura. *Clin. odontoiatr., Roma*
10:342-350 Sept. 1955

Cooley's anemia (thalassanemia), a hypochromic disease with numerous normoblasts in the blood, usually is associated with splenomegaly, and characterized by mongoloid facies, osteoporosis, perpendicular striation of the diploë and decreased fragility of the erythrocytes.

Six children of both sexes were examined in the pediatric clinic at Sassari, Italy. The children were between 15 months and five years of age. All exhibited, besides the known symptoms of Cooley's anemia, the following phenomena: pallid mucous membranes, morbid enlargement of the jaws and several forms of dental caries with softening of the dark brown colored dentin. The aspects were similar to those of hypophysial encephalomyelitis (Yaensch, Schneider, May and Best). Cooley's anemia influences the natural development and activity of the endocrine, suprarenal and thymus glands and the hypophysis cerebri. Pincherle, Scaglietti, Koch, Shapira, and Ortlani assumed that it was very possible that this disease can cause or favor the formation of caries through a diminished function of the hypophysis and severe disturbances in the dentofacial, latent and motor zones. Caries were especially frequent and serious in most of the maxillary teeth. The blood level, in regard to calcium, phosphorus and potassium, was almost normal, proving that demineralization neither caused nor influenced the occurrence of caries (Dechaume). The tissular dystrophy, however, was unquestionably caused by Cooley's anemia and its collateral symptoms (deficient aeration of the blood, leading to uncompensated acidosis). In addition to the other known symptoms, this disease presents a symptomatic complex in the oral cavity which should not be ignored, either in the diagnosis or the therapy, for the presence of anemia of the mucous membranes, hyperplasia of both jaws, macrodontia, different and severe forms of caries and neurovegetative dystrophy are the evident phenomena of Cooley's anemia.

Armamentarium and instrumentarium



Instruments

**The "Parotis" desiccator:
a new instrument for drainage
of intensive salivation**

(Der "Parotissauger": ein neuartiges Gerät
zur sicheren Trockenlegung
auch bei stärkstem Speichelfluss)

E. Langer, Toronto, Canada. *Zahnärztl. Welt*
10:328-329 June 25, 1955

Although the complete drainage of salivation in the patient's mouth during dental treatment is essential, most of the mediums and methods tried are far from being flawless. Surgery such as sialoadenectomy (excision of the salivary glands) or sialoadenotomy (incision and drainage of salivary glands) should be performed only if all other methods fail. Extreme salivation is always disturbing, and forces the dentist to work too rapidly and therefore, often, ineffectively.

The "Parotis" desiccator absorbs the salivary inflow directly at the orifices of the three salivary

glands, and prevents the saliva from entering the oral cavity. The instrument consists of three desiccators; its main part is a small platelike disk with a diameter of about 14 mm. Its inner surface has grooves (1 mm. wide and 1 mm. deep) connected with each other. On the outside, a tubule is connected to the grooves and its end is attached to the generally used saliva ejector by a thin rubber tube in a three way hookup. When in use, the grooved inner surface of the three disks rests on the orifices of the three salivary glands or in their immediate vicinity. The action of the saliva ejector causes the disks to become attached by suction to the mucous membrane.

The "Parotis" desiccator does not disturb the dentist's work; its application is simple and needs but a few seconds. Full effects of the instrument will be achieved only if all three disks are working simultaneously. In instances of an unusually unfavorable oral condition, or when the patient moves unexpectedly, the sublingual disk may be detached from the mucous membrane. Such a detachment can be avoided, if the rubber tube is drawn (either by the dentist or the patient) in a downward direction. The "Parotis" desiccator cannot be clogged up because only saliva and not small particles can reach the suction.

Complete drainage of the oral cavity reduces the pain caused by drilling, and second drainage of cavities before filling often will be unnecessary. This instrument enables the dentist to expedite his operations with less discomfort to the patient.

1. Main disk
2. Middle desiccator
3. Side desiccators



**A new two-way needle
for blood vessel anastomosis**

E. R. Jennings. *Heart Bul.* 4:69
July-Aug. 1955

A new instrument recently has been produced to simplify the everting mattress technic in all surgical sutures requiring anastomosis. It consists of a curved needle, pointed at both ends, and with the thread affixed to the center. Because of its pointed ends, the needle now can be passed in either direction without being reversed on its holder. The advantage of this new instrument is that no time will be lost during surgery—there will be no repeated unclamping, reversal and reclamping as is necessary when the standard type needle is used. The two-way needle is especially recommended in instances of arteriovenous, heterocladic, homocladic, precapillary, sinusoido-arterial and termino-terminal anastomoses.

**The effect of the contra-angle
upon the speed of the high speed handpiece**

James H. Wick. *Iowa D.J.* 41:305-307 Dec. 1955

The introduction of high-speed rotary instrumentation to restorative dentistry has led to improvements and refinements in the dental handpiece. An investigation is reported of the amount of reduction that occurs in the speed of the handpiece when the contra angle is attached.

Only standard equipment available on the open market was used in the tests. Three new handpieces, each with a different type of bearing construction, and their respective contra angles, were tested. All were designed for high-speed operation and were uniformly broken in, carefully adjusted and lubricated according to the instructions supplied by their manufacturers. All were tested under like conditions and at moderately high speeds ranging from 8,000 to 18,000 rpm. All known variables that would affect uniformity were eliminated or reduced. Correct belt tension was maintained.

The results are summarized in two tables. It was concluded that the contra angles would require a proportionally greater motor speed to obtain a given bur speed than would their respec-

tive handpieces. It was further concluded that improvements in the construction of the contra angles have not kept pace with those made in the handpieces. The efficiency gained from the improvements recently made in the design and construction of the high-speed handpiece is reduced materially when the contra angle is attached. The contra angle not only reduced the rotational speed of the handpiece but produced an increase in the amount of heat generated in the handpiece, which appeared to be in direct proportion to the amount of reduction in handpiece speed.

▼
Equipment

Dentotest

D. Malek-Naegeli. *Dental Echo*
25:76-77 Nov. 7, 1955

For establishing the correct diagnosis, in many instances, the x-ray machine has as many shortcomings as the old pulp tester. The practicing dentist, however, requires both diagnostic apparatuses, because when one fails the other may supply the required information.

Although there are several excellent x-ray machines on the market, none is able to perform the apparently simple task of establishing the vitality of the pulp. Shortcomings in the electric examination of the pulp vitality seem to be eliminated successfully by a new instrument, "dentotest." This apparatus is accurate in diagnosis, painless, and easy to manipulate. The electric current used in this method irritates the examined pulp only, but not the tissue surrounding the involved tooth. The cardinal source of diagnostic failures is eliminated. The electrode placed on the tooth, in combination with a reliable and stable electrical connection to the pulp, permits the impulse of the current to reach deep into the pulp cavity without causing disturbances. The current can be stopped immediately when the threshold of sensitivity is reached.

The dentotest is valuable mainly in establishing the degree of tooth vitality, and in detecting dental foci.

Rapid dental photography

S. Smoliar. *New York D.J.* 21:311-313
Aug.-Sept. 1955

A rapid method of obtaining individual clinical photographs is provided by a camera designed for 60 second production of finished photographic prints. The camera, manufactured by the Polaroid Corporation, can be used for clinical dental photography with only slight adaptation. Its chief advantage is that the negative is processed and a finished print is made inside the camera in 60 seconds, without the need of a darkroom or any other laboratory facility. The 3½ x 4½-inch photograph produced is suitable for reproduction in journals, filing with a patient's record, or giving to the patient. When photographs of the full face or profile are desired, the standard model 100 Polaroid-land camera with flash attachment can be used. When closer work is necessary, a Focalite attachment can be employed to eliminate the disadvantage of close firing of a flash bulb. For even closer photography, a series of three close-up lenses is available, together with a measuring device for estimating the proper subject-lens distance. The camera may also be used to copy roentgenograms. A disadvantage of the camera is the lack of a negative with which to make several copies of a picture.

**Therapeutics**

A new miracle drug—superior to morphine
(Ein neues Wundermittel—besser als Morphinum)

E. Heinrich. *Deut. Zahnärztebl.* 9:571-572
Aug. 8, 1955

Effective therapeutic action has been claimed recently for a new "miracle" drug that, unlike morphine, is efficient in the most severe instances, and will not lead to drug addiction. This compound, called "largactil" in England and "megaphen" in Germany, produces remarkable results. According to dentists experimenting with this drug, many patients emphasize: "One single tablet

draws a curtain between me and my pain." According to the reports, this preparation is not only quick-acting and stable but nontoxic and non-habit-forming. It effects the cerebral cortex and the hypothalamus simultaneously. It is possible that a mild form of temporary splitting of the personality occurs. An American dentist reported: "The patients regarded pain as an objective phenomenon—and were completely indifferent to the fact that pain still existed." "Largactil" or "megaphen," a phenothiazine derivative, has gained recognition not only from neurologists and psychiatrists but from many practicing dentists and physicians. Highly significant results were obtained in cases of periodontal disease, pericoronitis, gingivitis and trigeminal neuralgia.

Recent research in antibiotic therapy

(Neuer Erkenntnisse und Gesichtspunkte in der antibiotischen Therapie)

A. O. Zink. *Schweiz. Monatsschr. Zahnheilk.*
65:715-717 July 1955

The structural formulas of chlortetracycline (Aureomycin hydrochloride) and oxytetracycline (Terramycin) are relatively simple and chemically almost analogous. With increases in the therapeutic dosage of these broad-spectrum antibiotics, great losses in the blood level may occur by fecal excretion. With nontoxic penicillin, unfavorable side effects were observed in 5 per cent of the patients. Neurotoxic streptomycin and hematotoxic chloramphenicol (Chloromycetin) usually produce collateral symptoms. The broad-spectrum antibiotics unilaterally influence the intestinal flora, preventing a synthesis of the bacterial folic acids, and possibly producing a vitamin B deficiency. Simultaneously a prevalence of *Candida albicans* (highly pathogenic fungi) can be observed. The broad-spectrum antibiotics, especially chlortetracycline, in certain instances produce tonic effects such as an increase in appetite and a new formation of albumin.

The resistance of many microorganisms to antibiotics often is overemphasized; a continued resistance to streptomycin, however, has been reported by many authors. Gram-negative species acquire a certain degree of resistance to the whole group of broad-spectrum antibiotics, micrococci

and hemolytic streptococci only under aggravating circumstances. The resistance of micrococci to penicillin is of clinical importance. Experiments *in vitro* prove that different factors can influence the development of such a resistance. A test executed under analogous conditions with similar antibiotic solutions produced more than 1,000 dissimilar results.

According to the different species, types of infection and variations in proportion, an analogous potentialization can produce either synergistic or antagonistic effects. In instances of a mixed infection, the situation is more complicated. For the therapeutic application of all antibiotics, the *in vitro* observations are misleading. Only the synergistic combination of penicillin and streptomycin (the optimal proportion still is under discussion) seems to replace the other broad-spectrum antibiotics and stands the test, at least if administered orally.

**Evaluation of effectiveness
of recently introduced drugs** (Über die
Beurteilung der Wirkung
neuer Arzneimittel)

G. Kuschinsky. *Deut. med. Wchnschr.*
80:1287-1289 Sept. 9, 1955

The customary method of clinically evaluating recently introduced drugs is often inadequate to give a clear understanding of their pharmacologic and therapeutic actions. Many new remedies are praised for a year or two, only to fall into oblivion a short time later. Such early enthusiasm is nearly always influenced by commercial propaganda claims and by advertising tricks.

Early assertions of therapeutic value are not sustained by later, more sober, considerations. To think that it matters little to the patient whether therapeutic effect or plain suggestion is responsible for the drug's effects, is unethical. The physician or the dentist must be fully convinced that the method or the drug produced the result. They may later mistake genuine suggestion for curative action, and therefore lose all the scientific basis of therapy. Expensive drugs should not be prescribed when their therapeutic effect does not fully correspond to the high price. The very price

of a drug, however, can be a factor of suggestibility. Expensive placebos, such as modern vitamin compounds, are often imagined to be more "effective" than less expensive "blank" cartridges, such as glucose preparations.

From the ethical viewpoint, it is hardly permissible to administer "placebos" or other "pseudo drugs" when an effective drug is known and obtainable. As long as the correct value of a recently introduced drug is still under investigation, however, it is ethical to prescribe placebos for test purposes to a control group of patients.

Myasthenia gravis

R. Schwab. *Deut.med.Wchnschr.*
80:1642-1645 Nov. 11, 1955

Myasthenia gravis, a syndrome of fatigue and exhaustion of the muscular system marked by a progressive paralysis of the muscles without sensory disturbance or atrophy, may affect any muscle of the human organism, but frequently those of face, lips, tongue and throat.

This disease is caused by a pathologic deprivation of energy of voluntary muscles with a consequent inability to respond to stimuli.

Since the introduction of physostigmine and related drugs (pilocarpine, neostigmine and prostigmine), the mortality rate has fallen from 80 per cent in instances in which the condition has been present for two years, to 10 per cent in those in which it has been present for ten years.

Clinically, the small muscles of the eyes, the speech system, and the masticatory apparatus are mainly affected. Other muscles or muscle groups, however, can be involved. The degree of disability may vary considerably in different patients, and sometimes even in the same patient.

Diagnosis usually can be made from the case history. An intramuscular test injection of 1.5 mg. neostigmine methylsulfate (to which 0.6 mg. atropine sulfate is added) confirms the diagnosis, if the symptoms disappear in about 20 minutes. In 20 per cent of the instances tested, however, this experiment will be only partially conclusive. More objective criteria can be obtained by the use of dynamograph, dynamometer or ergograph.

Girls and young women are affected twice as

often as older women; older men, however, are afflicted twice as often as boys or young men.

The therapy consists in administration of neostigmine bromide, given in 15 mg. tablets. The use of atropine is contraindicated in treating the often appearing accessory symptoms because the curative effects of the neostigmine would be obscured. Cholinergic overstimulation must be avoided carefully, and if it occurs, must be counteracted immediately and vigorously. Ephedrine sulfate or ephedrine compounds have doubtful value, but their administration is harmless. Thyrectomy obtains favorable results in women below 40 years of age who have been afflicted with myasthenia gravis for less than five years, but for some unknown reason the surgical removal of the thymus is useless in men.

By careful supervision and treatment, 85 per cent of all patients now can hope to attain their normal life span. In many individual patients, crises may develop which in 50 per cent of the instances will end fatally.

Therapy of mycotic infection

Hobart H. Proctor. *J. Colorado D.A.*
33:10-11 Dec. 1955

Although molds and fungi are seldom thought of as causing disease, mycotic infections are probably the most widely distributed and most numerous types of infections. The fungous disease of primary importance to the dental profession is moniliasis. *Candida albicans* is a yeastlike fungus that ordinarily is a harmless inhabitant of the mouth and vaginal tract. The overgrowth of *C. albicans* is attributed to the oral administration of antibiotics. Patients with moniliasis will have an erythematous lesion under a complete or partial denture that hemorrhages on examination. The former treatment consisted of relieving the patient from wearing a prosthesis, and the use of gentian violet. On seeming recovery and the reintroduction of the prosthetic appliance, the infection recurred because of the presence of the fungi in the appliance.

Since April 1955 the author has treated 11 instances of both acute and chronic moniliasis with an antifungal antibiotic, nystatin (Mycostatin). Negative cultures were obtained in all instances,

one of which was of seven years' standing. There has been no evidence of recurrence to date (seven months). One instance, of one month's duration, yielded a negative culture in five days. Various forms of the antibiotic have been tried clinically, for oral, topical or parenteral administration. The systemic use of nystatin does not affect the oral condition as long as the prosthesis is worn. Nystatin in suspension, applied topically once daily in severe instances of the disease, eliminated the infection even though the prosthesis was worn continually.

Therapy of cervicofacial actinomycosis with paraaminosalicylic acid (PAS)

and isonicotinylhydrazide (Zachowawcze leczenie promienicy szyjo-twarzowej kwasem paraaminosalicylowym i hydrazidem kwasu izonukotynowego)

J. Adamski, Z. Baranczak, M. Dobek, J. Krajnik and T. Ziolkiewicz.

Czas.stomat. 8:61-67 July 1955

The close relationship which exists between the species of Actinomycetes and Mycobacteria (especially *Mycobacterium tuberculosis*) led to an investigation, based on the findings of recent biologic and bacteriologic research, into the treatment of cervicofacial actinomycosis with either para-aminosalicylic acid (PAS) or with isonicotinylhydrazide or with both combined.

The effects achieved by treating actinomycosis with penicillin, streptomycin and other antibiotics have been reported frequently. Para-aminosalicylic acid (PAS) or isonicotinylhydrazide effects *in vitro* an immediate restraint of the Actinomycetes, but not to the extent achieved by either penicillin or streptomycin.

Seven instances of cervicofacial actinomycosis were treated with para-aminosalicylic acid (PAS) and isonicotinylhydrazide either separately or combined, and in six instances complete healing was achieved within 30 days. In the seventh instance, an advanced and severe stage, improvement but not healing was obtained.

This therapy is of great economic importance because both drugs administered are less expensive than antibiotics such as penicillin or streptomycin.

On the basis of results revealed in biologic and bacteriologic research, it is recommended that penicillin and streptomycin is the preferred treatment for advanced or unusually severe instances of cervicofacial actinomycosis. In all other instances, however, in which the formation of granulomatous lesions and abscesses is not widespread, the more economical method of treatment with para-aminosalicylic acid (PAS) and isonicotinylhydrazide should be used, to which treatment actinomycoses will respond easily and satisfactorily.

**Emetine in animal experiment
and in treatment of periodontal diseases**
(L'ipertrofia gengivale da difenilidantoina nell'
animale da esperimento)

F. Vichi and P. Masi. *Minerva stomat.*
March-June 1955

After several tests with emetine during animal experiments, this drug was tried in four instances of severe and chronic periodontal diseases. Although the animal experiments, almost without exception, yielded favorable results, histologic studies of the reactions of the gingiva of the patients who volunteered for a trial treatment with emetine were entirely unfavorable.

Emetine, a white alkaloid powder derived from ipecac, acts violently and dangerously, especially in overdoses. The particles of the gingiva removed after treatment revealed almost the same aspects as the gingival particles taken before treatment for control purposes. This confirms previous clinical observations that in instances of severe and chronic periodontitis and related dis-

eases, the use of emetine as an exclusive therapy is not effective, and seemingly favorable results are only temporary.

Emetine, by its toxic action, may be effective in the region of the digestive apparatus, but certainly not in the vicinity of the periodontium.

**Homeotherapy in dentistry:
an introduction to homeopathy**
(Homöotherapeutische Ratschläge für
den Zahnarzt: Einführung in die Homöopathie)

H. Kritzer Kosch. *Deut. Zahnärzte Kal.*
14:225-239, 1955

Homeopathy, the art of treating diseases with medicaments capable of producing symptoms similar to those of the disease to be treated, is based on the theory "*simila, similibus curantur*" ("like cures like"). This system was founded by Hahnemann (1755-1843) and is based mainly on the principles of Hippocrates (460-375 B.C.) and Paracelsus (1493-1541).

Homeotherapy, using drugs only in minute doses, seems to be having a recent revival in Europe, especially in Germany. This therapy, applied to dentistry, proposes unusual remedies in the treatment of specific dental diseases.

The classic homeopathic drug is arnica (either *Arnicae flores* or *Arnicae radix*).

A detailed list of conditions and diseases, and the remedies recommended for homeopathic treatment, is presented.

The application of these homeopathic remedies, according to the author, may lead dentists into a therapeutic field up to now hardly known to them.

Oral surgery



Pathology

**Giant adamantinoma of the mandible:
resection followed by reconstruction
with implant of bone from patient**

(Adamantina gigante do mandibular:
ressecção seguida de reconstrução
com auto-enxerto ósseo)

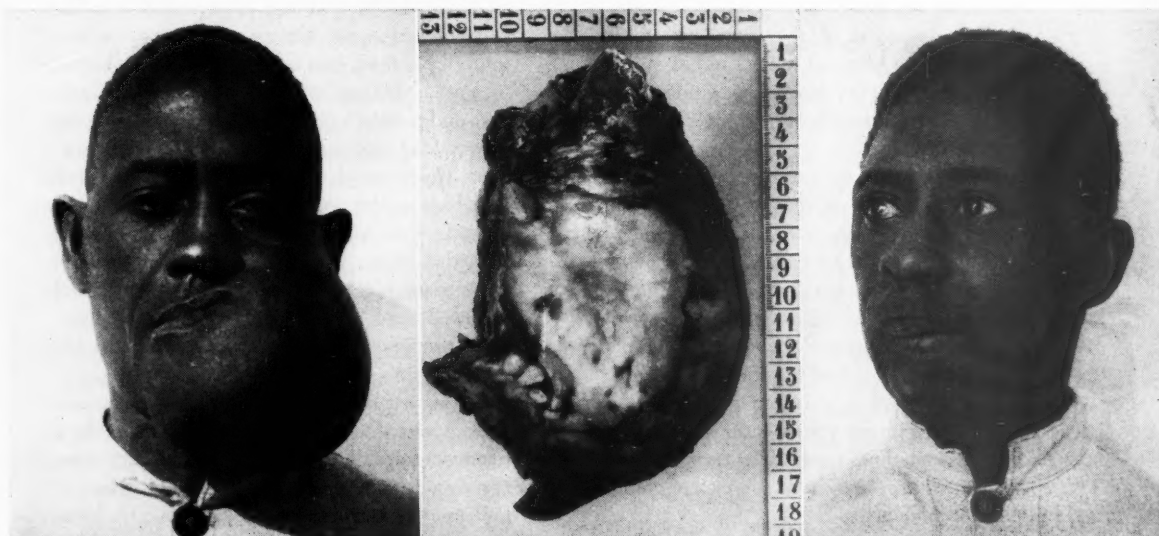
J. Paiva Chaves. *J. Estomat.* 2:3-6
Feb.-March 1955

A 57 year old man requested treatment because of discomfort caused by an enormous painless tumor of the mandible. Questioning and clinical examination elicited the following information: The patient had had a tooth removed from the left side of the mandible 20 years prior to con-

sultation. Four days after removal of the tooth he noticed a swelling of the jaw. In a short time, the swelling grew into an enormous tumor of bone consistency that occupied the entire left half of the face. Mastication and speech became difficult. The patient had had no previous treatment and he was in good general health, although he complained of a recent infection of a tooth in the left side of the jaw. A roentgenographic diagnosis of adamantinoma was made and an operation planned.

During the operation it was found that the tumor involved the bone up to the coronoid process. A subtotal resection of the mandible was made. Histologic examination of a lymph node removed from the submaxillary region during the operation, and of the tumor specimen, confirmed the roentgenographic diagnosis. The tumor weighed 890 Gm. The postoperative period and convalescence were uneventful. The second and third operations were performed two and five months after the first, for reconstruction of the mandible by means of bone implantation and reinforcement of the first implant, respectively. In both operations the implants were obtained from

Left: The tumor, of bone consistency, occupying entire left half of face. Center: Tumor which weighed 890 Gm. Right: View of patient who was discharged in good condition with a prosthesis



the iliac bone of the patient. The first implant took well and when seen during the second reconstructive operation it showed characteristics similar to those of normal bone. The functional results of both operations were satisfactory. The patient was discharged in good condition with a prosthesis.

Granuloma telangiectaticum in the oral cavity: report of case (Das Granuloma telangiectaticum: ein Fall in der Mundhöhle)

N. Schwenzer. *Zahnärztl.Reform* 56:251-252
July 1955

The granuloma telangiectaticum, a tumorous growth formed by granulated tissues and characterized by dilatation of numerous blood vessels, has been described in the literature under various names. Poncet and Dor called this granuloma "botryomycosis hominis," a term analogous to "botryomycosis" used in veterinary medicine. Recently, the designation "granuloma telangiectaticum" has been accepted internationally. Many authors, however, are still using such terms as "septic granuloma," "granuloma pediculatum" or "granuloma pyogenicum." The first two terms are obsolete, and the third is misleading because granuloma pyogenicum is the accepted term for another disease, a fungating pedunculated growth in which the granulation consists of pyogenic organisms.

The symptoms of the granuloma telangiectaticum are a blue-red, round and elastic granulation formation the size of a pea, and an inflamed surface which usually is covered by ulcerated epithelial tissue.

Kelly reported such a granuloma on the right posterior portion of the tongue; Cajkovac on upper and lower lips, and Anderson in the region of the left upper third molar.

The patient, a ten year old boy, presented, during periodic dental examination, a seemingly insignificant inflation of the upper lip. Immediate careful investigation of the oral cavity established the presence of a pea-sized granuloma on the mucous membrane which had developed during the previous three weeks. The neoplasm showed the complete symptomatic complex of granuloma telangiectaticum.

Therapy consisted of the surgical elimination of the growth and the involved tissues under local anesthesia. The wound was closed by primary sutures. Healing was uneventful, and the stitches were removed after three days. Four weeks later, the healing process was completed.

Microscopic examination of the excised tissue revealed the correctness of the diagnosis.

The granuloma telangiectaticum, occurring in the oral cavity, up to the present has not been considered to any extent in dental literature. It is frequently difficult to make the correct differential diagnosis, especially in instances where phenomena appear which are similar to those of other granulomas or of malignant tumors.

Often, as in the case reported, only the histologic picture can furnish the foundation for the correct diagnosis.

An unusual outgrowth on the crown of a tooth

Volmer Lind. *D.Practitioner* 5:332-333
June 1955

A ten year old boy had a projection on the labial aspect of his left maxillary lateral incisor which had erupted two months previously and was causing soreness of his lip. The projection had been visible through the gum before the tooth erupted. The boy's parents reported the projection had doubled in size since eruption of the tooth. There was no history of disease or trauma, and all his teeth had erupted at a normal time. The projection was in the center of the labial surface and formed a pointed hooklike process about 4 mm. long with a base about 2.4 mm. in diameter. The pointed extremity was bent forward. The base of the projection was smooth and appeared to be covered with enamel continuous with that of the labial surface of the tooth, but the surface of the extremity was irregular and yellowed, and resembled dentin or cementum. Roentgenographic examination showed that the apex of the root was not closed.

During a month's observation, no dimensional change was detected. The projection was then removed carefully with small burs. There were two minute depressions containing soft tissue at the site of removal; it was not possible to deter-

mine whether they were connected with the pulp cavity. A dressing was applied to the surface of removal. A month later a silicate filling was inserted. About two years later the tooth was still vital, and roentgenograms showed that root development had been completed. The projection was fixed in 10 per cent Formalin, decalcified and sectioned through its long axis. It consisted mainly of dentin. The enamel was irregular in structure, and in some places surrounded by dentin. The dentin contained many cavities or channels, one of which communicated with the surface and was partly filled with a granular material. In some places the dentin and the enamel were covered by a tissue resembling bone with cells in the lacunae and spaces containing a cellular connective tissue among its substance.

Giant cysts of the jaws (Grands kystes des maxillaires)

L. van de Vyver. *Rev. belge stomat.*
52:287-294 May-July 1955

The variations of cysts, affecting both jaws, are numerous. The apical or paradental cyst, on the side of the involved tooth, is caused by chronic irritation of epithelial (embryonal) fragments of Hertwig's sheath in the periodontal membrane (Malassez's rests); the coronodental (follicular or odontocoele) cyst contains one or more imperfectly developed teeth; the dentigerous cyst contains one or more fairly well-formed teeth; the multilocular (adamantine) cyst encloses many loculi (spaces) that usually are endogenous daughter cysts, developed from walls of larger cysts; and the alveolodental cyst is formed around foreign bodies or exudates. Paradental and coronodental cysts spread over cellular parts, often without invading osseous structures; multilocular cysts, however, produce tumors and reappear often after temporary or incomplete subsidence.

Clinical symptoms are constant—the patient feels slight, painless enlargements in the involved region. These cysts hardly involve vital structures, the tooth roots being protected by periodontal lamellae, and the canals of both jaws being covered by compact osseous formations.

Roentgenographic examination is important in the diagnosis of all cysts, especially traumatic

cysts, and the observations will establish the correct course of therapy. The initial diagnosis of giant cysts of the jaws, based on case history, clinical appearance and roentgenographic examination, should be corroborated by subsequent histopathologic findings. The dimension of the cyst also is a factor of primary importance. When a fistulous tract is present, the surface epithelium may grow into the cystic cavity, but this growth does not obscure the histologic process.

In most instances, surgical intervention is necessary. The cystic cavity may be exposed by either extraoral or intraoral incision. The bony cavity also must be exposed, the overlying bone decorticated and the contents evacuated. Partial resection of the jaws usually prevents regeneration, and it may be necessary to utilize grafts from the crest of the ilium.

Lesions of the temporomandibular joint (Lesiones de la articulacion temporo maxilar)

Claudio Funcia C. *Acad. odont.* 2:108-116
Jan.-Feb. 1955

Pain in the temporomandibular joint is often due to disturbances that can be corrected by appropriate dental care. This is especially true of conditions resulting from abnormalities of occlusion and articulation, which can be relieved or remedied only by adjustment of the bite, the use of prostheses, or various orthodontic or exodontic procedures.

Compression of a nerve is sometimes erroneously said to be essential to the production of pain, but is in fact unnecessary. Edema, muscular spasm and even simple fatigue induced by prolonged abnormal positions of the mandible are sufficient to cause severe pain, often accompanied by impairment of function. Earache, headache, cervical pain, paresthesias of the tongue and pharynx, salivary gland disturbances, and masticatory muscle spasm may all originate in abnormalities of articulation. Sensitivity to pressure, lateral displacement of the mandible on opening of the mouth, and crepitation on palpation are the major clinical signs to be looked for in establishing a diagnosis.

Treatment for immediate relief should include

the following: (1) a change in mastication to the unaffected side, except when the pain is due to displacement of the condyle anteriorly against the articular eminence instead of posteriorly or centrally; (2) acquisition of the habit of keeping the lips closed and the teeth slightly separated, so that the condyle assumes its correct position of physiological rest, and (3) medication. The administration of 50 mg. of thiamine hydrochloride and 500 mg. of ascorbic acid daily will help to reduce edema and relieve pain. Salicylates are also useful for the relief of pain, and mephenesin may be given in doses of 0.50 to 2 Gm. daily. Hydrocortisone, however, when not contraindicated, is the most effective medicament available. Physiotherapy, especially with ultrasonics, is beneficial in some instances, and psychotherapy is helpful in correcting nervous habits and mannerisms, such as excessive pressure of the fist against the chin, or grinding of the teeth.



Roentgenology

Radium therapy in cancer of the skin and lip

B. L. Feuerstein. *Am. J. Roentgenol.*
74:500-507 Sept. 1955

Most instances of cancer of the skin can be cured by roentgen rays or by radium therapy. In recent years the former has replaced radium in most institutions. A method of treatment is reviewed which is believed to have lost favor undeservedly with most radiologists. Treatment can often be simplified and better cosmetic results obtained if the operator is adept at both methods. Radium therapy usually gives a better cosmetic result and is preferred where a high depth dose is to be avoided and in small, early lesions. The author uses radium for the lesions of the lips overlying the junction of the lip and gum, and for lesions on the bridge of the nose. Radium therapy is the only method available when the patient cannot or will not leave his home. Small epitheliomas of the lip are suited for contact radium therapy;

larger epitheliomas of the lip are treated with radium molds. Roentgen therapy is preferred in less accessible areas, such as near the eye, and in large bulky lesions. A table summarizes the results in 140 consecutive cancer patients whose condition was proved by biopsy and who were treated with radium; 139 have remained free of disease.

The apical focus: roentgenization and roentgenotherapy (der apicale Herd:

Röntgenbestrahlung und strahlentherapeutische Beeinflussung)

C. Kruchen. *Zahn-Mund-Kieferhk. Vortr.*
16:182-191, 1955

For nearly 60 years, roentgenology has been used in the diagnosis of odontopathies. The roentgenograms, however, show only fundamental and morphologic changes in the hard tissues. A correct diagnosis can be made only after a comparison of roentgenographic observation with clinical observation. Roentgenotherapy was scarcely used in dental practice, and the literature overlooked almost completely the possibility of roentgen ray treatment in instances of focal infections. Only Heidenhais (1920), Pordes and Holzknacht (1924-1926), Weber (1947) and recently Pape and Driak reported favorable results achieved by roentgenotherapy in such instances. Many dentists, however, still hesitate to use roentgenotherapy, usually because cooperation between the dentist and the roentgenologist is difficult to achieve and maintain. Many dentists possess a limited knowledge regarding the effectiveness of roentgen rays or of the compatibility of the patients, and they overestimate the danger of roentgen rays to dentists and patients.

Roentgenotherapy is indicated in such instances as tumors, actinomycosis, epulis, trismus, arthritis and peri-arthritis of the temporomandibular joint, periodontal diseases, infected roots and root remains, gingivitis, granuloma, nonvital pulp and fistula. Roentgenotherapy is contraindicated in pulpitis. Acute focal infection should be treated with small doses of roentgen rays, given at short intervals. In instances of chronic focal infections, the doses should be increased but the

intervals then should be from five to eight days. The influence of roentgen rays on connective tissues is moderate. The irradiation usually applied is with hard or medium hard rays of 1.0 or 0.3 mm.Cu.; a glass tube of from 2 to 3 cm. is used. The idea that the effects of roentgenotherapy are only destructive and are comparable to surgery is absurd. Fractional irradiation often leads to strengthening of tissues, protection of the mesenchyma and a functional increase of the connective tissues. Animal experiments have proved that even cancerous tissues, implanted in already irradiated regions, show similar reactions to those shown by irradiated healthy tissues (Bauer). Roentgen rays, in the doses usually applied, do not destroy bacteria and other microorganisms, as do bactericidal drugs, but they change the environment and increase the activity of the defense mechanism. Calcareous infiltration accompanying peri arthritis recedes completely after irradiation, and the same effect can be achieved in instances of myositis ossificans. The practical value of roentgenotherapy, especially for acute infections, and difficult root treatments, consists in the fact that a small dose, similar to that used in dental diagnosis, achieves surprisingly favorable results.



Anesthesia and analgesia

Nitrous oxide and oxygen anesthesia in dentistry (Zahnärztliche Narkose mit Lachgas und Sauerstoff)

F. W. Clement. *Schweiz. Monatsschrift. Zahnheilk.* 65:717-720 July 1955

The practicing dentist may select from the following drugs the anesthetic best suited for his purpose: ether and ethyl oxide (and their various derivatives), vinyl ether, ethyl chloride, cyclopropane, chloroform, thiopental sodium, trichloroethylene, and, last but not least, nitrous oxide. For many dental purposes, nitrous oxide still is the anesthetic *par excellence*. Its advantages—speedy action, quick and natural absorption—

surpass the disadvantages: brief effect and difficult application (special apparatus). A short case history should be taken and an examination made; after anesthesia with nitrous oxide and dental intervention, the normal patient will be able to pursue his daily business without discomfort and complaint. Abnormal patients, however, such as alcoholics, drug addicts and athletic types may present a strong resistance to nitrous oxide and other anesthetics. Subnormal patients, such as those with anemia, diabetes or malnutrition, usually are strongly affected by anesthetics. Secobarbital, a short-acting sedative and hypnotic, is used for premedication with good results. The average dose is 1½ to 3 grains. After premedication, the patients can be dismissed only when accompanied by other persons.

Persons in healthy condition, or those showing a strong resistance to anesthetics, may receive pure nitrous oxide by inhalation. If premedication is used or trichloroethylene is employed as an adjunctive agent, less nitrous oxide is required and a higher proportion of oxygen may be used. Patients in a condition below or less than normal, and children between the ages of three and 14, receive from 5 to 10 per cent oxygen and the rest nitrous oxide. All symptoms of the anesthetized patient must be observed carefully, especially the controlled normal respiration. During the third stage of anesthesia, the dosage of oxygen should slowly be increased from 5 to 15 per cent. After extraction or any other surgical intervention, a few breaths of oxygen should be given.

Complications seldom occur during anesthesia with nitrous oxide and oxygen. Cardiac arrest is difficult to overcome for the average dentist. Asphyxia (blue and traumatic) can be caused by an overdosage or by an obstruction of the respiratory tract. Artificial respiration with pure oxygen and freeing of the respiratory tract should be undertaken immediately. Injections do not help and usually are too late.

Aspiration of foreign bodies usually can be prevented. If this condition occurs, pure oxygen should be inhaled. Roentgenographic examination will then reveal the cause, and a bronchoscopic extraction will be necessary. Postoperative hemorrhages hardly present a problem and usually can be avoided by the use of suitable sutures and tracheal tampons.

The signs of hypoxia are as follows: hypotension, abrupt and then arachnoid pulse, positive oxygen-apnea test, extreme mydriasis without reaction to light, weak and irregular breathing, and muscle spasms. Also cyanosis can be present. Hypoxia can be prevented by an experienced dentist if the symptoms during the anesthesia are always closely watched, especially changes in breathing. During anesthesia the oxygen content of the anesthetic formula should slowly be increased. The most important factor is the anesthesiologist, for "no anesthetic is more reliable than the person who uses it."

Premedicating agents for ambulatory dental patients

Martin H. Blitzer. *Internat. J. Anesth.*
2:234-237 June 1955

Premedication for general anesthesia allays fears and apprehension, reduces the amount of secretions during induction and maintenance of anesthesia, lessens psychic traumas, creates partial or complete amnesia, often produces basal narcosis, and minimizes vagal and autonomic reflexes. Most agents for premedication, however, cannot be used in office anesthesia since the patient must, as a rule, be ambulatory. A search is under way for agents that will produce the advantages listed and still leave a patient ambulatory, conscious and alert postanesthetically. The results achieved in a study of nine agents, each administered to 25 patients, are reported.

Dimenhydrinate (Dramamine) was tolerated well by persons from 17 to 45 years old. There was no nausea or vomiting. Dosages varied from 25 to 50 mg., utilizing both the elixir and tablet forms. Sodium pentobarbital (Nembutal) was given in dosages from 0.75 to 1.5 grains, to patients ranging in age from six to 58 years. Dosage must be fairly heavy to produce adequate sedation. This drug was beneficial for postsurgical sedation. Methantheline bromide (Banthine bromide) is sedative, anticholinergic, antispasmodic and antisialogogue, is especially valuable for nervous boys and girls, but not useful in the very young or the elderly. The dosage was 50 mg. Dicyclomine hydrochloride (Bentyl hydrochloride), given in 50 mg. capsules, produced in-

adequate sedation. Dactil (50 mg. capsules) produced good sedation when used with phenobarbital. Dactil is an anticholinergic drug which exhibits postganglionic, parasympathetic depressive action. Results were poor with three patients, good with 12, excellent with ten. When patients were given butabarbital sodium (Butisol sodium) in dosages from 0.5 to 1.5 grains, ten had excellent sedation and 15 had poor sedation. Algoson tablets produced sedation but also produced awareness and a sense of well-being. Poor results were obtained with eight patients, good results with eight, and excellent results with nine. When 50 to 100 mg. Dactil was combined with 0.75 to 1.5 grains butabarbital sodium, a result was produced that seemed to meet the basic requirements of a preanesthetic medication for office use better than any other drug or combination tried. Of the 25 patients, excellent results were obtained from 18, and good results from six. There were no observable side reactions. All patients were ambulatory with no drowsiness, nausea or vomiting. Chlorpromazine hydrochloride (Thorazine) (10 to 25 mg.) is a relatively new agent. It is a central nervous system depressant with mild antispasmodic, antihistaminic and adrenolytic activity, and potentiates the therapeutic effect of certain drugs. A side effect is drowsiness.

Evaluation of a new anaesthetic agent in dentistry: a preliminary report on 114 cases of thioseconal

W. H. Myers. *D. Practitioner* 5:288-290
May 1955

Thioseconal, an intravenous anesthetic similar to several other intravenous drugs, is made up for use by dissolving the contents of a 0.5 Gm. ampule in 20 cc. of water, especially distilled for intravenous use. Ten cubic centimeters of the water is used to dissolve the thioseconal powder; this is returned to the vial, so that in the vial is 20 cc. of a 2.5 per cent solution. The solution is injected into the veins of the antecubital fossa. The usual dose is about 10 cc. for an adult. The effect resembles that obtained by the other intravenous barbiturates, except that there is little if any apnea, and no laryngeal spasm. The drug

Table Average in a series of 114 cases using 2.5 per cent thiosecnal

Age	34 yrs.
Weight	10 stone
Amount of 2.5 per cent solution	10 cc.
Weight of powder	0.25 gm.
Number of teeth per patient	9
Operating time	3 min. 13 sec.
Recovery time to reflexes	50 sec.

gives ultrashort action, an adequate safety margin as judged by the breathing and absence of spasm and apnea, and a fast emergence from sleep. The author has been able to extract as many as 24 teeth with a single administration of 10 cc., and with no supplement, and the patient has had all his reflexes back within 30 seconds. The author's experiences are summarized in the table. The drug is not commercially available as yet.

A study of two methods for testing local anesthetics in man

J. L. Mongar. *Brit. J. Pharmacol.* 10:240-246
June 1955

The activity of five local anesthetics in man is studied by two methods. In the first, the subject is injected on the flexor surface of the forearm with four or six wheals containing different concentrations of two local anesthetic drugs in solution. Each wheal is tested for anesthesia by pricking six times in different places with a pin, the number of pricks not felt giving a measure of the degree of anesthesia. In the second method, an area of dermis is exposed on the flexor surface of the forearm, a 0.3 per cent cantharidin plaster applied, the resulting blister bathed in a local anesthetic solution, and the area mechanically stimulated with a spring-loaded camel's-hair brush. The degree of anesthesia is assessed in terms of a three-point scale as slight, appreciable, and full anesthesia.

Dibucaine hydrochloride (Cinchocaine hydro-

chloride) was found to be 49 times more active than procaine (39 to 61, $P = 0.05$) when compared by the wheal method in a test with 46 subjects. In a test with 57 subjects, dibucaine hydrochloride was 50 times more active (43-59, $P = 0.05$). In a test with 52 subjects, lidocaine was 2.6 times more active than procaine (2.2 to 3.1, $P = 0.05$). By the intradermal method the activity ratio of dibucaine hydrochloride and procaine was two to three times greater in man than in the guinea-pig. By the exposed dermis method, activities relative to procaine were: cocaine 2.5, dibucaine hydrochloride 33, lidocaine 2.3, butacaine sulfate 8.0, tetracaine hydrochloride 34, and propoxycaine hydrochloride (Ravocaine hydrochloride) 7.6. By both testing methods, dibucaine hydrochloride acted more slowly than procaine. The precision of the intradermal wheal and the exposed dermis methods is compared, the latter being about 20 times more efficient in terms of the number of subjects required for an assay of given accuracy. The increase in precision obtained by the exposed dermis method is attributed to elimination of variations in the test area: all the solutions can be tested repeatedly in the same site under identical conditions.



Surgical technics

Electronic surgery in restorative dentistry

S. Charles Brecker.
New York J. Den. 25:295-299 Oct. 1955

The three tube, fully rectified and filtered electronic instrument is an important adjunct to, rather than a substitute for, the scalpel in dental practice. The three tube, fully rectified generator is an ideal instrument because the rectified and filtered true radio current does not scar tissue. The commercial current passes through a transformer and then through two half-wave rectifying tubes which change the current from alternating to a pulsating direct current which is then converted to a very high frequency electronic (not electric) current by means of an oscillating

tube. A controlled and uninterrupted arc is formed which does the cutting. Physical and surgical advantages of this type of generator are: (1) elimination of current surges and lapses which makes for even, smooth cutting; (2) elimination of heat; (3) prevention of the formation of scar tissue; (4) the field of operation is practically bloodless and dry, and (5) the operator with the wire electrode can approach easily any part of the tissue in the mouth. The tissue is severed by cellular explosion, without trauma, and the cut heals without undue pain. The types of current on the three tube generator are scalpel or cutting current, coagulating or dehydrating current, and fulgurating or current of destruction of living tissue. The wire loop electrode is the most effective and efficient medium. These loops, which are of assorted sizes and shapes, can be used to cut, plane, carve and festoon the gum tissue. Straight wire electrodes, some in angle holders, are ideal for incisions in the interproximal areas.

A few drops of procaine are injected into the tissue to be severed, but no profound anesthesia is necessary. Lidocaine ointment, spread on one surface of a small piece of sterile gauze, is held firmly over the gingiva for about three minutes. A Mizzy 30 gauge unbreakable needle is used in the syringe to inject the anesthetic in and around the interdental papillae. The tissue is dried with a piece of gauze before cutting, inasmuch as moisture dissipates the current used. The indifferent plate may be draped over the back of the dental chair. The tissue is cut toward and over the teeth, in a shaving motion. The cutting motion must be rapid and light because slowness is responsible for too much coagulation and may cause sloughing. The electronic current within the tissue forms the tiny arc just ahead of the progressing electrode. The electric arc, not the wire loop, does the cutting, so no pressure need be used. The electrode should not be held still, for if it is, it will produce heat and may act as a

cautery. The cutting loop should cut freely, without undue flashing of the electrode on the tissue. The lowest current that cuts freely to the desired depth should be used. The structure of the tissues as well as the rapidity of motion influence the amount of coagulation and the ease of cutting. The more fibrotic the tissue, the more resistance will the electrode meet. If too much resistance is met, the current may be stepped up gradually. Sometimes it is advantageous to cut with the coagulating current to minimize bleeding. Tissue should be dried often. A zinc oxide and eugenol paste should be applied to the cut surfaces in the form of a pack, to allay pain and discomfort and to promote healing. The patient is instructed to refrain from using a toothbrush on the treated areas and to resort to an antiseptic (but not an astringent) mouth wash. The oral cavity must be kept clean. Should part of the dressing fall away to expose the cut area, the patient must return for a new pack. In about five days the pack is removed, the cut gum tissue swabbed with a pledget of cotton saturated with hydrogen peroxide, and the dressings replaced until healing is complete which is anywhere from two to six weeks.

Electronic surgery is indicated in instances involving use of a short posterior tooth as a bridge abutment; in patients of middle age with noticeably worn teeth; in minor periodontal disturbances; for removing tissue growing into a cavity; when the gingival margin is so placed that it is traumatized frequently during mastication; in hydrocolloid impressions of individual teeth; for removing flabby tissue, interfering scar tissue or frena in an edentulous mouth to facilitate denture seal; to remove tissue in an edentulous area to make room for pontics; to remove inflamed, impinged and traumatized tissue around the second or third molar regions responsible for a pericoronitis, and for cutting tissue around a healthy root stump which is to receive a cast base crown.

Prosthetic dentistry



Crown and bridge

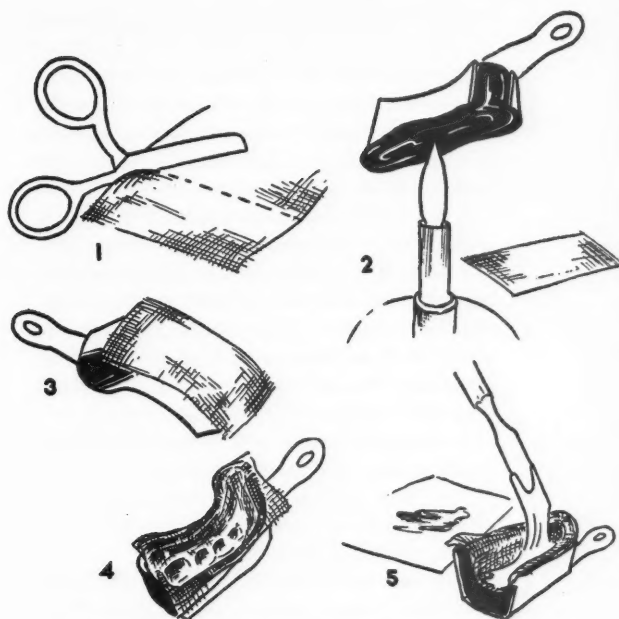
An impression tray for rubber base materials

Richard D. Morrison. *Washington Univ.D.J.*
22:8, 18, 19 Nov. 1955

In the clinical use of rubber base impression materials it has been difficult to obtain a rigid matrix or tray within which these materials can be retained. A technic has been developed which offers a simple, economical solution to the problem, utilizing materials readily available in the dentist's office.

1. A strip of fine gauge, single thickness gauze is cut to fit within the dimensions of an impression tray.
2. The impression compound is heated and placed within the tray; the surface of the compound is flamed.
3. The gauze strip is placed over the surface of the tray.
4. The tray is lifted to the mouth and a gauze-lined impression is obtained, dried by a stream of air and allowed to harden.
5. The rubber base material is mixed, flowed within the depth of the tray, and a final impression made.

The bond is maintained more than 12 hours. Before the first pouring, wax is flowed about the periphery of the impression, covering any excess of gauze. This step simplifies separation of the



Steps in a simple technic for facilitating the use of rubber base impression materials

impression and the stone model. After approximately 18 hours the bond of the rubber base material and the compound loosens. The gauze and rubber base material may be stripped easily from the compound, allowing for the latter's further use.

Hypersensitiveness to dental prostheses made of steel

(Überempfindlichkeit gegen Heilbehelfe aus Stahl)

E. Perger. *Zahnärztl.Praxis* 6:6 Nov. 1, 1955

Reports appear occasionally in medical and dental literature, indicating that allergic phenomena were observed in patients wearing either dental prostheses or where fractured or displaced bones were held together by splints made of steel. Unquestionably these allergic reactions were caused by hypersensitiveness to steel.

In most of the instances reported, stainless steel had been used in the construction of splints or dental prostheses as a substitute for more expensive metals. Until recently, it has been thought that stainless steel was unaffected by most acids or organic fluids, and that the utilization of this metal therefore was safe.

A patient with several crowns made of stainless steel exhibited during periodic examination several allergic symptoms such as fulgurating migraine, irritation of the vegetative system, an inclination to agitated depression, and eczemas over the whole body causing constant burning and itching. His emotional dejection even had led to suicidal attempts.

An allergy test made with ferrum III complex bound on carbohydrate was positive.

After the stainless steel crowns were eliminated, the eczemas immediately disappeared and the emotional disturbances decreased.

Macroscopic examination revealed an easily observable abrasion and corrosion of parts of the crown. Whether these alterations of the metal were caused by chemical or electrolytic influences was not determined.

The allergy test with ferrum III makes it possible to diagnose the unusual and exaggerated specific susceptibility of patients not only to steel but to other substances which usually are harmless in similar amounts. The results obtained by this method are clearer and more unequivocal than those obtained with the commonly applied tests where minute metallic parts are brought into contact with the patient's skin.

A method of transforming three-quarter crowns to Richmond crowns

(Eine Methode zur Umarbeitung einer Dreiviertelkrone in eine Ringstiftkrone-Richmondkrone)

K. Keresztesi. *Österr.Ztschr.Stomat.*
52-492-493 Sept. 1955

The construction of a three-quarter crown, intended to support bridges or other prostheses in the region of incisors or bicuspid, can achieve the desired esthetic objective only when the vital pulp can be preserved. In instances in which veneer crowns are either contraindicated or ob-

jected to by the patients, the Richmond crown best accomplishes the purpose.

Teeth with three-quarter crowns are more susceptible to secondary caries than those with Richmond crowns. Therefore, in patients who have a tendency to caries or who do not practice sufficient oral hygiene, three-quarter crowns are contraindicated. The probable cause for the frequent occurrence of caries in teeth with three-quarter crowns is the relative length of the unprotected margin, and the habitually unclean condition of gingiva and teeth. Poorly fitting margins of imperfectly constructed crowns facilitate the development of caries. Three-quarter crowns also have less retention potentiality than complete or Richmond crowns; loosening occurs more frequently, resulting in recurrent caries.

Insignificant carious defects, as in teeth without crowns, can be treated with gold, amalgam, cement or methyl methacrylate fillings. In instances in which caries does not extend into deeper regions, the obsolete three-quarter crown should be transformed into a jacket crown. If there is continued progress of secondary caries, neither three-quarter crown nor jacket crown is indicated. In such instances, the Richmond crown is required, especially if the pulp chamber is involved which would make the fixation of other types of crowns unreliable.

The old three-quarter crown can then be transformed into the desired Richmond crown. A recommended timesaving method consists in removing the old crown, treating and filling the root canal, removing the coronal portion of the tooth and preparing the root end for the application of the Richmond crown, and construction and fitting of the crown cap. This Richmond cap then is mounted on the prepared tooth root. The gingival part of the old three-quarter crown has to be shortened so that the gingival edge can neither touch the occlusal surface of the metal ferrule nor disturb the position of the partial prosthesis. This partial prosthesis should be attached temporarily to the metal ferrule with adhesive wax. Then a plaster cast is made, showing in minute detail the patient's oral condition. The prepared parts of the new crown are then soldered to the metal ferrule. In such a manner, the skeleton of the Richmond crown is formed; its correct position in the patient's mouth can be

tested. The acrylic resin or porcelain face can then be constructed.

This method of transforming an obsolete three-quarter crown into a new Richmond crown can also be used in instances in which the old crown had been used as an anchor for a fixed bridge.

Alginate impressions confined in alginate (Impresiones de alginato confinadas en alginato)

Pedro Saizar. *Rev.As.odont.Argentina*
43:293-295 Aug. 1955

Simple alginate impressions may present several defects, such as bubbles, holes, lacunae, ruptures, cold runnings, ridges and internal tensions, all of which are due to the physical properties of the material used. Alginate impressions confined in wax eliminate these inconveniences, but they present others. Alginate impressions confined in alginate offer no inconveniences at all. A technic for alginate impressions confined in alginate is presented. It consists of the following steps:

1. A simple alginate impression is taken in an ample perforated tray.

2. The posterior and vestibular over-extended excess of alginate, the vibrating ridges and any overflow of the alginate projecting toward the inner part of the impression are trimmed. Three millimeters of alginate around holes in the dental impression is scooped out with a small rubber scraper or else a flat bur in the form of a blade. For good confinement, the alginate at the bottom of the dental holes covering perforations of the tray should not be removed during the scooping process. If the mucosal alginate surface of the impression is ample and smooth, some retentions can be made with an instrument on the impression.

3. The impression is humidified. A small amount of alginate is prepared and used in filling the dental holes; the material is allowed to extend beyond the limits of the holes. The impression is then put in place with a firm movement and a little vibration on the tray so as to favor displacement of the bubbles.

4. When the tray reaches its proper place, vibration is exerted on it for an instant to eliminate elasticity developing in the alginate of the base. Then it is retained immobile but without

any pressure until the second alginate has been hardened.

5. After the second alginate is hardened, two minutes are allowed to elapse. The impression is then detached, with a firm hand, in a direction parallel to the dental axis.

6. The ridges are trimmed, and the impression is placed in a fixation solution composed of potassium sulfate, 2 per cent, alum, 3 per cent, and other substances, in which it is kept for ten minutes. After this period, the impression is taken out of the fixation solution and the casting is made.

This technic has given satisfactory results in preparing partial or complete immediate or regular prostheses. Alginate-alginate impressions constitute a technic of value, especially so because of the precision of the results obtained within a very short period of time.

The veneered full cast crown

Arthur Sokoloff. *J.Florida D.Soc.*
26:5-8 Nov. 1955

The author examined 450 bridges, ranging from small cantilevers to large multiple-abutment restorations, including 1,014 abutments. These fixed bridge abutments were rated according to their efficiency; 18 per cent of the inlays, 15 per cent of the three-quarter crowns, and 4 per cent of the complete cast crowns were found to be unsatisfactory. The most common fault was leakage of margins, or open margins with potential leakage. The second most common defect was overhanging margins which caused tissue inflammation, and the rarest defect was the "loose" inlay or crown—a type of functional or mechanical failure.

The complete cast crown offers the following advantages as an abutment: (1) maximum retention; (2) maximum freedom from subsequent caries; (3) maximum esthetics; (4) ease and rapidity of preparation, and (5) superiority in recontouring the abutment tooth.

In preparing a tooth for a full crown, sufficient tooth structure must be removed to allow for adequate gold bulk. There must be no undercuts. A gingival shoulder should extend labially from contact point to contact point, with a standard tapered finish on the lingual surface. The shoulder

should extend well beneath the free gingival margin. As much bulk as possible should be removed from the labial surface of the complete preparation from incisal to gingival surfaces, with a lingual tapering of the incisal third of the tooth. This allows for the maximum bulk of acrylic resin, an important cosmetic factor. Inadequate bulk of the acrylic resin gives poor color control in the veneer, and may lead to seepage.

A gold mesh screen, cast to the labial face of the crown, provides maximum retention for the veneer. This should be supplemented with a complete undercut around the face, with a sharp angle and a definite finishing line. The face of the crown should not be overwaxed. The wax should be only slightly heavier than the desired finished contour. Contour should be utilized to control the passage of food buccally or lingually. The incisal contour must be protected with an adequate bulk of gold.



Complete dentures

Subperiosteal dental implants

Alan Mack. *British D.J.* 99:287-293 Nov. 1, 1955

An increasing volume of clinical, histological and metallurgical evidence on the implant denture is becoming available, and many successful cases have been described. The evidence is summarized, and indications and contraindications for the use of an implant are listed.

The body fluids, the blood, lymph and interstitial fluids contain electrolytes in aqueous solution resulting in the formation of ions. If this solution is exposed to the action of an electric field formed by the difference in potential between the implanted metal and the body fluids, an electric current is formed. If such a current is above the limits of tissue tolerance, a breakdown of the cells adjacent to the metal will occur, leading to clinical failure of the prosthesis. For the implant to be successful, these criteria should be met:

1. The metal should be noncorrosive and electrically inert in the body fluids, and must not contain any toxic substance.

2. The implant must be constructed so that the tissues are not irritated mechanically.

3. Any mechanical process carried out during the construction must not alter the physical or chemical characteristics of the metal.

The indications for the use of an implant are as follows: (1) in instances where orthodox dentures have proved unwearable, because of gross resorption of the alveolus, pain, persistent retching, high muscle attachments, or flabby or pendulous tissue over the ridges; (2) when an abutment is needed for unilateral free end saddle prostheses where the retention of an orthodox denture is difficult; (3) for the replacement of single anterior teeth, and (4) in instances where the patient wishes to improve masticatory function and is willing to submit to the fairly extensive surgical procedures to gain this end.

Contraindications are: (1) where a denture or bridge can be constructed that will restore function; (2) where normal alveolar resorption is not complete, and (3) where the patient is in ill health. Roentgenographic examination is essential to ascertain the condition of the bone and the possible existence of any anatomic abnormalities.

Technics of designing, constructing and fitting the implant are discussed. It is estimated that in the United States 400 implants had been inserted by 1953, and that today about 1,000 implants are in use in all countries. Ten implants executed by the author since 1952 are discussed.

Prosthetic dentistry

John W. Geller. *J. Wisconsin D. Soc.* 31:213-215 Oct. 1955

Practical ideas which have proved successful in the work of the Indianapolis Dental Research Group are presented.

Study casts and roentgenograms should be made for all patients at the first appointment. The prosthetic problem should be presented to the patient so that he might have the choice between full mouth reconstruction and complete dentures. The happiest patients are those who can retain teeth they thought were to be removed.

The most successful immediate dentures are made for patients who have had the posterior teeth extracted first, while retaining the anterior

teeth until proper healing of the posterior alveolar ridge has occurred. Immediate denture impressions should be made carefully. The opinion of the patient has of the dentist's ability is dependent on the retention of the dentures. Immediate denture patients are told that frequent relining will be necessary, and that a second set of dentures will be required in six or eight months.

Individually prepared acrylic trays are indicated for the edentulous impression technic.

The recording of a vertical relation and the technic used should be based on an understanding of the nerve supply to the muscles of mastication, the function of these muscles and the general adaptation syndrome of the patient. The factors of tactile sense and freeway space are important only as reference points. The rest position is not a constant but depends on the general adaptation syndrome.

The position of the teeth is determined by the functions required of the teeth.

The problem of function in restorative dentistry

Max Kornfeld. *J. Pros. Den.* 5:670-676
Sept. 1955

The practice of dentistry is the science of occluding teeth. The dentist must comprehend both the fixed biologic factors and those subject to change by the dentist. The cusps, sulci and fossae of teeth that will function properly in the given mouth are the result of these fixed and variable factors. It is the dentist's job to record these factors and to make restorations according to them. The biologic factors necessary to a physiologic articulation are described, and the way to locate the hinge axis, record the centric relation, and determine the condyle path are discussed. The Bennett movement—the jaw movement used by the patient to triturate food—dictates the positions of the working cusps. All fixed biologic factors must be faithfully recorded and reproduced, and variable factors that are not anatomically fixed must be wisely altered, for successful restorative work. Under any given set of these factors, there is only one set of cusps that can function in harmony with jaw movement. The principles of gnathology provide a means for re-

cording and transferring the fixed biologic factors accurately. By means of the hinge-bow and the gnathograph, the author is able to record accurately the opening and closing axis, the protrusive, the protrusive lateral and the basic lateral positions, with or without the Bennett movement, as the joints dictate. Gnathologists assert that whenever the teeth are placed in proper occlusion, their periodontium improves in health and tends to remain healthy.

Retching presumed to be caused by prostheses made of polymerized resin (Würgereize bei Palodonprothesen)

L. Hupfaut. *Zahnärztl. Praxis* 6:4 Nov. 1, 1955

Sporadic references in dental literature describe allergic reactions resulting from wearing dental prostheses made of synthetic resins. Although there is no general agreement as to the importance of these reactions, they occur sufficiently often to warrant an understanding of their nature so as to differentiate between allergic reactions and similar phenomena.

The patient, a 43 year old man, previously suffering from trigeminal neuralgia, wore upper and lower prostheses made of polymerized resin. The lower prosthesis caused no disturbance but the wearing of the upper denture always was accompanied by severe disorders such as retching. Constant use of the upper prosthesis seemed unbearable. The repeated ineffectual attempts to vomit did not occur during mastication but only during the act of swallowing.

Strong involuntary efforts to vomit frequently occur after patients receive their first artificial dentures, irrespective of the material used in the construction of the prostheses. The oral cavity, in the initial stage, is immensely sensitive to all foreign bodies. These symptoms, if they are not of an allergic nature, disappear in time.

In the instance reported, only one prosthesis produced the disturbances despite the fact that both dentures were made of the same material, and therefore not the substance itself but errors in the construction were the causative factors.

The mucous membrane of the hard palate had been under a constant pressure, and the prosthesis, in rocking movements, produced a hollow

space between the denture and the mucous membrane.

Irritations of such kind certainly are liable to cause retching, because the involved tissues are highly sensitive to pressure and aggravation.

After correction of the minor errors in construction of the upper denture, and after a repeated brushing of the irritated regions with a paste containing a mild anesthetic, the unfavorable symptoms disappeared.

The foregoing recommended procedure will fail only in the few instances where a true allergy to prosthetic material exists. In such cases, after a careful allergometric test, a different method of treatment must be employed.

A realistic and rational approach to complete denture construction

Irving R. Hardy. *Ann. Den.* 14:127-130
Dec. 1955

If Professor Kinsey were to review the denture problem, he would find at least as wide a discrepancy between theory and practice as he found in his learned studies on sex.

When the edentulous patient presents himself for examination, it is sensible to get his history and try to make a diagnosis. Systemic factors must be considered. Factors to study in the mouth examination include ridge relationships, high or low frenums, tori, the mylohyoid ridge, and the soft palate attachment. These parts should be palpated and evaluated.

In taking the impression, the tray must be adjusted in the mouth. When the baseplates and biterims have been built on the casts, the length of the upper base should be established and post damming to produce good retention should be performed. At this point theory and practice often clash, and these steps are often left to the judgment of the laboratory technician. This is a mistake, as this important registration can be accomplished only by using the vibrating line of the soft palate, with the hamular notches as guides; these anatomic landmarks cannot be identified accurately on a cast.

If the registration of vertical dimension and centric relation of the mandible to the maxilla are

accomplished on temporary bases, such bases should be stable. In establishing the correct vertical dimension, the thing to avoid is overopening.

The dentist with a developed tactile sense can register the centric relation by placing his index fingers gently on the lateral borders of the lower base (to keep it in position), and directing the patient to curl back the tongue to the distal border of the upper base; the mandible can then be felt moving back to its most retruded position. The dentist without this skill had best take a Gothic arch tracing.

For fine results, the dentist must select the teeth and arrange them. He should not refer these steps to the dental technician. A major discrepancy between the theory and practice of complete denture prosthetics is encountered in the selection and arrangement of posterior teeth. If the dentist is going to employ anatomic teeth—cusp teeth—he should supply himself and his technician with the following data: centric relation, face-bow measurement, protrusive record, and right and left lateral records. As practiced, the dentist registers the centric relation of mandible to maxilla and instructs his technician to set up, for instance, 20 degree posterior teeth. In practice, the dentist receives the processed dentures from the laboratory, inserts them in the patient's mouth, and, with articulating paper, registers the obvious high spots and grinds them. This hit-and-miss procedure mutilates the teeth, seldom eliminates the lateral interferences, and never produces balance.

The author uses nonanatomic (cusplless) teeth which require for their arrangement only an accurate vertical and centric relation record. After they have been processed, they can be adjusted in the mouth. The teeth, which have metal cutting blades embedded in plastic, can be ground to correct errors in occlusion as great as 2 mm., if necessary. If such a gross error occurred with cusp teeth, and the error was corrected by grinding, all that would be left would be a block of porcelain, devoid of cutting efficiency. The metal bladed teeth, no matter how grossly ground, can be restored in two minutes to their original efficiency, by cutting away the plastic material from the blades with a large inverted cone bur. These teeth will cut meat and fibrous foods as well as will perfectly balanced cusp teeth.

Preventive and public health dentistry



Dental health education

Effect on oral cleanliness produced by dental health instruction and brushing the teeth in the class room: The 1953-1954 Baltimore toothbrushing study

H. Berton McCauley, Lillian B. Davis and Todd M. Frazier. *J. School Health* 25:250-254 Nov. 1955

The 1953-1954 Baltimore toothbrushing study was undertaken to determine whether a short course of instruction in dental health produced any measurable effect on the cleanliness of the teeth of upper elementary-grade children. Two groups of children, predominantly of the fifth grade, were studied. One contained 491 boys and girls in 13 schools who received a month-long course of instruction in dental health, including a series of practice periods during which they brushed their teeth in the classroom. The control group consisted of 283 boys and girls in eight schools who received no instruction in dental health or toothbrushing. All the children in both groups received inspections by a dentist to determine the status of oral cleanliness on four separate occasions: (1) immediately preceding the course of instruction, (2) at the close of the course, (3) one month after the course, and (4) shortly before the close of the school year. Each child received an oral hygiene score which expressed numerically the relative cleanliness of the teeth and mouth. Inspections were done in two waves, the first beginning in September 1953, the second in February 1954.

The children who received instruction in dental health showed an improved general state of dental and oral cleanliness over a period up to five months after the close of instruction. Similarly aged children whose teeth were inspected con-

currently but who did not receive dental health instruction, also showed improvement, but of a lesser order. Gains in oral cleanliness realized through instruction and repeated inspections diminished gradually after instruction was discontinued and the inspections apparently assumed some characteristics of a routine procedure.

A survey study of public opinion and education concerning dentistry

Clayton Kelly Gross. *Oregon D.J.* 25: 2-9 Sept. 1955

The author surveyed public attitudes toward the dental profession as expressed in a return of 163 questionnaires circulated in three locations in Portland, Ore. The answers indicated in part that:

1. Slightly over two-thirds of the population have a family dentist.
2. About a half of the population have voluntarily changed dentists at one time or another, the chief reasons given being poor workmanship, overcharge, rough or painful work, and difficulty in securing appointments.
3. Sixty-nine per cent of the people choose a dentist on the recommendation of friends.
4. People prefer their present dentist because of the quality of work (46.90 per cent), fair charges (18.60 per cent), personality (14.15 per cent), and convenience of location (6.19 per cent).
5. The average person last saw his dentist 10.2 months ago. He ordinarily visits the dentist every 12.9 months.
6. A third of the dental visits are for emergency reasons, and the balance are for regular check-ups.
7. About two-thirds of the people claim to brush their teeth twice a day.
8. More than a third of the people have never received professional instruction in the proper method of toothbrushing.
9. A large majority (83.5 per cent) uses tooth paste in home care. The interdental stimulator is used by only 4.60 per cent.
10. Twenty-six per cent of the people receive oral prophylaxis every six months, and an additional 26 per cent, every year.

11. Only about 5 per cent of the people understand the theory behind fluoridation of public water supplies, but 60.0 per cent favor it.

12. Six different reasons were given as the cause of tooth decay; 45 per cent chose inadequate cleansing.



Hygiene and prophylaxis

Oral hygiene in the Orient (Mittel der Zahnpflege im Orient)

K. Rozeik. *Österr.Ztschr.Zahnhk.* 9:179 Sept. 1955

Modern oral hygiene consists mainly of application of toothbrush, dentifrices and mouthwash. Frequently, however, these media, especially the toothbrush, are not correctly applied. Although some tooth pastes have a certain ability to clean the accessible surfaces of the teeth, commercial claims that they can maintain the oral cavity free from all residual stains and from dental calculus and other salivary deposits are unfounded. The primary purpose of tooth pastes is to assist the toothbrush in cleaning the teeth, and possibly to obtain additional benefits by an inclusion in the paste of agents with specific biologic and therapeutic action. These agents, however, must be fine-grained so as not to cause unwanted abrasion of the hard substances. Some tooth pastes contain chlorophyll (or its derivatives) for deodorizing purposes. The content of soap in a dentifrice should never exceed from 3 to 5 per cent because dental substances will be cut away by a continued use of tooth pastes containing harsh abrasives. Many tooth pastes also contain natural or synthetic flavors or detergents, noncarbohydrate sweetening agents, and even a few contain sugar. Commercial claims for an "antienzymatic" or an "antibacterial" activity of recently introduced dentifrices have not been adequately established.

In many parts of the Orient, oral hygiene in the Western sense, is unknown. As a replacement for toothbrush and dentifrice, the "siwak" is used generally. This fragrant implement is made from the wood and the roots of the *Salvadora persica*,

a small shrub, growing in Egypt west of the Nile, in the oases of the Sahara and other Asian and African deserts, on Mount Sinai, and in many areas ranging from Arabia to Iran. The branches and roots, bound into bushels, are commercially handled, and bought and sold in all oriental countries. The structures of this plant are extremely fibrous and contain sodium bicarbonate, which acts as a disinfectant. Before application, the siwak has to be soaked in plain water for about 24 hours until all fibers separate. Then the fibers are tenderized by constant beating. Disadvantages of the siwak are the imminent danger of injuries to the soft parts of the oral cavity by splinters, and the comparable inflexibility of the fibers which allows only a vestibular application in horizontal direction.

The branches and roots of the date palm (*Phoenix dactylifera*) and of the olive tree (*Olea europaea*) are used in eastern African and Asiatic countries in the same manner as siwaks. Egyptian farmers utilize for oral hygiene purposes pieces of mastic (a resin obtained from *Pistacia lentiscus*) in the form of chewing gum, mixed with beeswax.

Toothpicks, called "chilals," made from the peduncles of several types of *ammiaceae*, which have aromatic flavors such as anise, caraway or dill, are used in many parts of the Orient. These chilals have a pleasant taste, but their value for oral hygiene is limited. Claims made by native dentists and world travelers that the use of chilals results in a reduction in the incidence of dental caries are unsubstantiated.



Statistical research

The incidence of gingivitis among a sample of Brisbane school and pre-school children

B. J. Kruger. *Austral. J. Den.* 59:237-239 Aug. 1955

A dental survey in 1954 of the incidence of gingivitis among Brisbane preschool and school children ranging in age from 3 to 13 is reported. The

PMA index as outlined by Schour and Massler was used to record the incidence of gingivitis. Only one examiner did the scoring; the results were recorded by a trained dental attendant. An ENT headlamp was used for lighting. The results of the survey are published in two tables. A child was classified as having severe gingivitis if the total PMA for that child was greater than twice the average. In the 3 to 5 year age group, the classification severe gingivitis included all PMA's greater than 9; in the 6 to 8 year age group, greater than 16; in 9 to 11, greater than 22, and in 12 to 13, greater than 26. The percentage of children with gingivitis ranged from 49.0 in the three year age group to 90.5 in the nine year age group. Throughout the age groups there was a definite correlation between dental caries attack and the incidence and severity of gingivitis.



Caries etiology and control

Speculations on lactobacilli and acid as possible anti-caries factors

Albert Schatz and Joseph J. Martin. *New York D.J.* 21: 367-379 Oct. 1955

According to the chemicoparasitic theory of dental caries, the bacterial fermentation of carbohydrates produces acid that causes tooth decay by decalcifying enamel. *Lactobacillus* is the acidogenic organism that has received most study. Some investigators, however, consider proteolytic destruction of enamel matrix to be the major factor in dental caries. The histologic evidence which focused attention on proteolysis and the high incidence of tooth decay suggested that proteolytic microflora should be abundant, especially in carious mouths. Efforts to demonstrate a keratinovorous microflora in the mouth were inconclusive until recent experiments based on soil microbiology and comparative biochemistry showed that keratin-digesting protista do inhabit the mouth. The discovery of these organisms resulted from efforts to interpret the dental carious process as a naturally-occurring chelating system. In this light dental caries becomes merely one of

many phenomena throughout nature, all characterized by the solution and transport of ordinarily insoluble mineral matter under the influence of living organisms and their products.

The proteolytic theory of dental caries has been modified to include chelation; so modified, it may account both for matrix destruction and apatite dissolution as two related and simultaneously operative effects of the same fundamental mechanism. The proteolysis-chelation theory poses anew the significance of lactobacilli and other acidogenic organisms in tooth decay. Some oral bacteria have been shown to be both proteolytic and acidogenic, depending on the nature of the available substrate. If dental caries results from proteolysis combined with chelation, these dual effects may account for destruction of both the organic and inorganic constituents of teeth at the same time.

The behavior of lactobacilli in the mouth could not be evaluated fully until the occurrence of oral keratinolytic organisms had been established. A consideration of the interrelationships between proteolytic and acidogenic organisms leads to the possibility that lactobacilli may be the effect instead of the cause of tooth decay. Acidogens may serve as external environmental agents militating against caries. If so, a new acidogenic theory would view lactobacilli as a preventive factor rather than the cause of dental caries.

A theory of pedogenesis or soil formation corresponding somewhat to the acidogenic theory of dental caries postulates that rocks are dissolved by carbonic and other acids originating from the microbial decomposition of organic matter. This theory has been modified recently in terms of chelation.

The widespread occurrence of keratinolytic organisms in human mouths may account for the high incidence of caries. It is possible that the proteolytic destruction of enamel keratin may result from the synergistic action of organisms. Oral microorganisms may exploit sugars to facilitate their proteolytic attack on enamel matrix keratin. The caries-potentiating action commonly attributed to sugar may be divorced from acidogenesis and lactobacilli and may be associated with augmented keratinolysis.

Eighty-nine references are listed in the bibliography.

The distribution pattern of dental caries

Ram Sarup Nanda. *Human Biol.*
27:210-230 Sept. 1955

In collecting data on the epidemiology of dental caries, various designations such as DMF (decayed, missing and filled) and CRL (cariou, restored and lost) have been used for both teeth and tooth surfaces. These indexes are not always appropriate and sometimes may lead to confusion. At the time of examination two or more coalesced carious lesions may appear to involve two or more surfaces of a tooth and this destruction may, in reality, represent a one-surface lesion which has been left untreated and which has progressed so as to involve other tooth surfaces. Teeth may be missing for a variety of reasons. Many compound fillings do not indicate precisely which surface or surfaces were involved originally by the process of tooth necrosis.

It seemed desirable to conduct a statistical analysis of clinical data which did not necessitate the inclusion of any hypothetical material. The pattern of spread of proximal carious lesions in the permanent teeth of 140 young, white, American women was investigated. A complete clinical examination of each dentition was carried out by the author, utilizing artificial illumination, a sharp probe and a mouth mirror. The examination and recording of observations were done with extreme care, taking about 15 to 20 minutes in each instance. A complete set of intraoral and bitewing roentgenograms was taken, and the clinical recordings were carefully verified by comparing them with the roentgenographic observations. Each filling was taken to represent a carious lesion. For purposes of analysis, only the mesial and distal surfaces were considered.

Statistical tests in both individuals and groups indicate that the occurrence of carious lesions in corresponding proximal surfaces of antimeres—the phenomenon of bilaterality—is not explainable fully on the basis of mere chance and that, likewise, their occurrence in adjacent proximal surfaces cannot be attributed to accident in all instances.

The susceptibility of each tooth and each proximal surface varies greatly in different individuals.

There is a definite tendency toward a more or less specific regional distribution of lesions.

The first molars constitute the bulk of the extracted teeth. Mandibular first molars are more often extracted than maxillary first molars.

The usual point of origin of proximal dental caries is the distal surface of a second bicuspid or the mesial surface of a first molar, in either arch. The subsequent spread of lesions is determined chiefly by the individual susceptibility of each tooth and proximal surface, and usually follows a characteristic tautologous pattern.

The last proximal surfaces to succumb are, ordinarily, the mesial surface of the maxillary first bicuspid and the mesial surfaces of the mandibular central and lateral incisors.

No relationship between the length of time a tooth has been in the oral cavity and its susceptibility to dental caries was found.

Fluorine and iontophoresis (Fluor und Ionophorese)

H. Abel, Lovetec, Bulgaria. *Schweiz. Monatsschr. Zahnhe.* 65: 784-788 Aug. 1955

For the last ten years, the prevention of dental caries has been the center of all professional discussions in the Bulgarian dental publications. The increasing number of young dentists, educated at the University of Sofia, and the results of the decentralization program of the government which provides all dentists with official or semi-official positions in all areas from the largest cities to the smallest villages, enable the Bulgarian Ministry of Public Health to introduce and execute prophylactic procedures on a nationwide scale.

The prophylactic effect of fluorine now is generally recognized. At present, experiments are carried out with topical applications of a paste containing 2 per cent sodium fluoride. Only dentists are authorized to give this treatment. Although the results achieved to date seem favorable, a final tabulation cannot be published nor an evaluation made after such a short time.

Another method, still in the testing stage, is an electrical impregnation of fluorine into the dental tissues by iontophoresis—the technic of in-

production of soluble fluorine ions by means of electric currents.

Transmission of these fluorine ions is possible even when a relatively weak current is used. The time of impregnation is considerably shortened, however, when an intensive continuous current is used. The stronger current allows a deeper penetration of active fluorine ions into the caries-susceptible regions such as dental fissures and interproximal spaces. As yet, there is no documentary evidence on either the duration of effects or the stability of the consequences achieved by iontophoresis.

If the international dental profession also would experiment with the technic of fluorine impregnation by iontophoresis, and if similar favorable and conclusive results were observed, this method could prove to be the best available procedure in the prophylaxis of dental caries.

Lysine and cariogenicity of two experimental rat diets

F. J. McClure and J. E. Folk. *Science* 122:557-558 Sept. 23, 1955

The effect of lysine on the cariogenic potential of three diets was studied. The first diet contained heat-processed cereal foods; the second, commercial roller-process and spray-process skim-milk powders, and the third, dry autoclaved skim-milk powder. Growth failure resulted from feeding the first or third diet to rats of the Holtzman or the Sprague-Dawley strains. The teeth of these rats showed severe smooth surface caries. The addition of approximately 2.5 per cent L-lysine hydrochloride to these two diets "reduced caries approximately 59 per cent in incidence, 78 per cent in number of carious teeth, and 83 per cent in severity score." Compounds similar to L-lysine in composition and structure did not inhibit the caries produced by the diets.

The second diet supported growth, so presumably contained lysine. It proved, however, to be distinctly cariogenic, and its cariogenic potential was not significantly inhibited by the addition of L-lysine. It is suggested that the cariostatic effect of L-lysine is dependent on its dietary deficiency.

Epidemiology

Dental research and preventive dentistry

H. Trendley Dean.
New Jersey D. J. 27:21-26 Sept. 1955

Prevention of disease generally involves the practical application of findings from the fields of both basic and developmental research. Basic research is the seed corn of research which must precede the later harvest of applied research. The tissues, the vascular, nervous, glandular and lymphatic systems of the oral cavity are as much a part of the human body as any other area. Consequently, the transfer of findings, ideas, technics or instrumentation from one field of biological investigation to another is limited only by the imagination and versatility of the dental investigator. A vast reservoir of basic research is now available in the literature for all to use.

In the past 15 years medical research has grown at an unprecedented rate. The total expenditure for medical research in the United States increased from an annual expenditure of \$18,000,000 in 1941 to \$181,000,000 in 1951. In this same period dental research was affected only slightly. Dentistry, however, is utilizing advantageously what funds it can procure. In March 1955 at the general meeting of the International Association for Dental Research, 211 papers were presented orally, of which 174 were in the biological field. In 1950 there were only 82 papers read at the annual meeting. Among the authors of the 174 biological papers were 52 listed as having the Ph.D. degree and no dental degree. In addition there were 22 dentists presenting papers who also had Ph.D. degrees. The increasing number of basic scientists casting their lot with dentistry augurs well for the future.

The epidemiological field surveys and field trials which led to approval of fluoridation as a cheap, effective measure of partial mass control of caries are reviewed. The theory of fluoridation is now an indisputable scientific law. Fluoridation, despite its impressive benefits, is not a cure-

all for dental caries. Other preventive methods must be kept in mind: reduction in the amount of refined sugar consumed, topically applied fluorides, and removal of carbohydrates from the mouth by brushing the teeth immediately after each meal. Basic and applied research must be expanded in order that dental caries, as well as dental conditions other than tooth decay, may be brought under an increased measure of control. The dental scholar of the future will find himself increasingly engrossed in the fields of physiology, bacterial physiology, biochemistry, enzymology, cytochemistry, biophysics and other disciplines that may provide information on the vital activity of cells composing the periodontal tissue.

School dentistry

Soroptimist dental health program

Shar Southall. *J.Am.D. Hygienists' A.*
29:151-152 Oct. 1955

The Soroptimist International, of Wheeling, W. Va., a women's service club, became interested in dental health when it learned that a checkup of children's teeth in the schools had revealed that nearly 1,500 students of grades one to six in Ohio County needed dental care and that their parents could not afford to pay for it. After discussions with the Wheeling District Dental Society, the public school dental hygienist, the West Liberty State College, and public and parochial school officials, the club in 1953 initiated a dental program.

Initially only third grade children whose teeth are in the worst condition and whose parents are the neediest are being cared for. Each year, student dental hygienists from West Liberty State College, as part of their off-campus training make a check of grade school students and clean the teeth of those requiring it. They fill out charts supplied by the Soroptimist club for each child. These charts are studied in selecting the children who most need dental care. Permission is received from the parents to provide dental care for the children. Care is extended without regard to re-

ligion or race. In 1953 the club expended \$251.75 in providing care for 17 children. In 1954, 58 children received complete mouth care. In addition to restorative work, extractions were made free of charge by local hospitals when needed. Because of limited funds, the club has not yet begun supplying more than restorative work. It is planned eventually to expand the present program to children from the first through the sixth grades.

Toward improving school dental health

Leonard F. Menczer and Irving L. Maislen.
J. Connecticut D.A. 29:12-16 Nov. 1955

In January 1955 the Connecticut State Departments of Education and Health forwarded to the superintendents of schools in the 169 towns in that state recommendations for an ideal school dental program. Subsequently a questionnaire on school dental programs was sent the superintendents. The 136 replies were tabulated.

Eighty-six town officials reported a recent survey had been undertaken of dental health needs in the local school system.

Seventy-five reported that the local school system now had a topical fluoride program. Of the 61 towns reporting no such program, 18 stated they planned to develop such a program.

Eighty-three towns reported they were releasing children during school hours to receive dental care.

To the question, are school lunches and school parties being supervised so as to provide training in sound food habits and to insure normal nutritional needs? 120 reported affirmatively.

One hundred and ten reported that candy and other confections were not sold in the schools.

The answers to the questionnaire reveal that much is to be desired in the various dental programs throughout the state. Many town officials indicated that the dental inspection was the extent of a survey of dental health needs, and only 60 per cent of the reporting schools had acted even to that extent.

Only 55 per cent of the reporting schools had a topical fluoride program under way, and only 13 per cent (18 communities) had such a program for the recommended age and grade levels

(7, 10 and 13 year olds—second, fifth and eighth grades).

It is encouraging to note that 61 per cent of the reporting communities released children during school hours to receive dental care, and that an additional 18 per cent looked on such a practice favorably if time other than school hours was not available. The large percentage of schools reporting that school lunches were being supervised, and that candy and other confections were not sold on the school premises, indicate forward strides in improving child dental health and in insuring that school children receive training in sound food habits.

A study of Connecticut's 1,560 licensed resident dentists revealed that 40 of the state's 169 towns have no dentists. This means that many school children have no access to private dental care. The State Health Department has only one mobile dental unit to serve rural Connecticut. It is the responsibility of dentists and dental societies to give leadership and aid in solving the problems related to dental health.



Nutrition

Preventive nutrition in orthodontics and general dentistry

(Nutricion preventiva en ortodoncia y odontologia general)

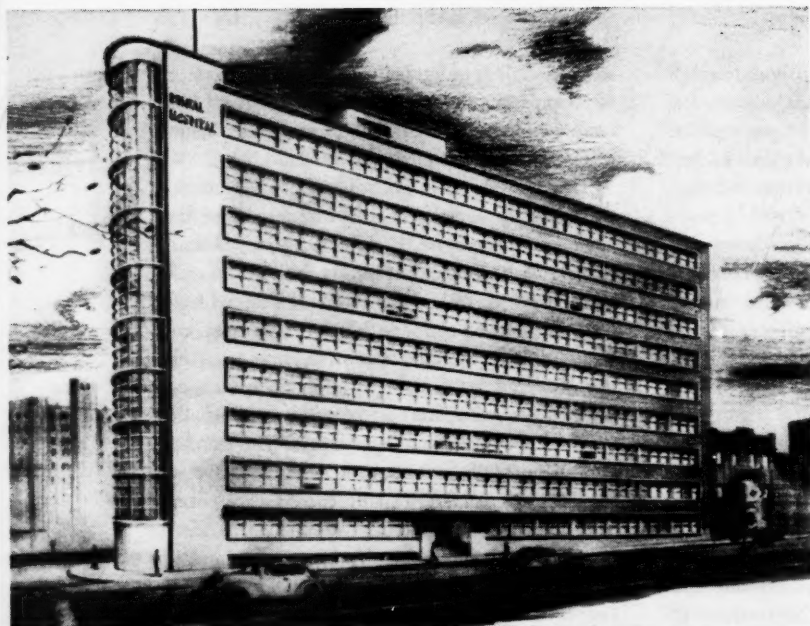
Roberto M. Ruff. *Rev. A.D.Mexicana* 12:84-89 March-April 1955

The practical application of modern nutritional knowledge to patients undergoing orthodontic and other dental treatment will not only improve their general condition but will make the treatment more effective. In advising his patients about their diet, the dentist should take into con-

sideration their individual requirements as related to occupation, age, sex, physical activity, and even psychological and emotional factors, which often influence the choice of food.

The first step is to find out what the patient's diet actually consists of, and the results of this inquiry, especially with children, are sometimes surprising. Records kept for a week showed breakfasts consisting of hot cakes and milk for an eight year old girl, and coffee with milk, three teaspoonfuls of sugar, jelly and a roll for an 11 year old boy. For luncheon, the girl had two hot cheese sandwiches, salad, milk and a sweet, whereas the boy had rice, a stuffed pepper, preserved peaches and water. Dinner was little better, and such snacks as were taken usually consisted of cakes, rolls and sweets. Obviously, diets such as these fail to permit a normal physiologic response to orthodontic treatment. Correct nutrition for a ten year old child undergoing such treatment would require recommendation of the following regime: breakfast—orange, grapefruit or other fruit in season, two eggs with ham, bacon or beef tenderloin, toast and a glass of milk; midmorning—fresh fruit or fruit juice; dinner—soup, preferably of fish or vegetables, fresh salad, meat, fish or chicken, two vegetables, a glass of milk and fruit; midafternoon—fruit, salted peanuts, and so forth; and supper—tomato juice, meat, ham or cheese with vegetables and fruit.

Color slides have proved effective in instructing children and their parents in the correct choice of foods. Striking results in the control and prevention of caries can often be obtained by correcting dietary faults, and the dentist who understands the value of proper nutrition can do much to advance the cause of preventive medicine. Dental decay is virtually unknown in at least one region (Mezquital) where, although nutrition is extremely deficient, the food eaten by the Indian inhabitants is 100 per cent natural. Undoubtedly, modern methods of food processing destroy many food values, some known but others still unknown.



The dental hospital of Sydney

Professional activities



Education

The new dental school and hospital

Editorial. *D.J. Australia* 27:201-202 Oct. 1955

A new dental hospital at the University of Sydney was completed this year. The building now consists of eight floors and a basement. All departments have been extended to accommodate the teaching of dental students and to afford more treatment to patients. The teaching of prosthetic dentistry is now concentrated on two adjoining floors, and the teaching of operative dentistry and its subordinate subjects of crown and bridge-work and ceramics takes place on one floor. The mezzanine sixth floor has been restored to afford better light to the operative department.

The Institute of Dental Research now occupies the seventh floor and has been extended to pro-

vide laboratory space for research workers and graduates studying for higher degrees, and space for routine and investigational work conducted within the institute. The institute will have its own animal house. The department of preventive dentistry (which also embraces orthodontics, periodontics, pedodontics and nutrition) occupies half of one floor and includes a large clinic for children, roentgenology and processing rooms, a dietitian's room, and an area used for instructing children and mothers in the practice of dental hygiene.

The University of Sydney opened its School of Dentistry in March 1902 with 17 students. In 1901 the University Dental Hospital was established to provide dental attention to persons unable to pay normal dental fees, and to provide facilities for instructing students. A Dental Hospital of Sydney was also established in 1900 to provide dental treatment for members of the community unable to afford private dental treatment. The two dental hospitals were amalgamated in 1905 to form the United Dental Hospital of Sydney. In 1935 a program was launched to provide a new building for the School of Dentistry.

Some observations on dental education and dental research in New Zealand and in Australia

Victorino G. Villa. *J. Philippine D.A.*
8:1-4 May 1955

Each of the five dental schools in Australia is an integral part of a state university. The accrediting and regulating agency of dental education in Australia, as for all members of the British Commonwealth, is the General Medical Council of Great Britain. A graduate of any of the dental schools of Australia can be registered automatically, that is, without any dental board examination, in any of the six states of Australia and in any part of the British Commonwealth except Canada. But graduates and diplomates from British dental schools can be registered only in New South Wales, Australia, after passing a special state board examination.

Physically the dental schools of the University of Sydney, New South Wales, and of the University of Melbourne, Victoria, compare favorably with some dental schools in the United States. Each school is associated with a general dental hospital providing all types of dental service to the public, particularly to persons unable to afford the fees of private practitioners.

The organization of the faculty is patterned after the English system, classified into professors and various grades of lecturers. Instruction in the various medical sciences is conducted in the respective departments in the medical school. In Melbourne, the Dental Hospital, the Dental Board of Victoria and the Australian Dental Association (Victoria branch) are represented in the faculty.

The dental school of the University of Otago, New Zealand, is organized along the Australian pattern, and has a Dental Hospital Department with its own staff. New Zealand has no dental board but has the Dental Council of New Zealand which functions like a dental board. The dean of the dental school is an ex officio member of the Council and is chairman of the qualification committee of the Council which considers applications for registration from countries outside New Zealand.

All the above universities offer undergraduate

and graduate courses in dentistry. Study in the undergraduate course is equivalent to five years after secondary education and after passing an entrance examination on prescribed subjects. In Sydney and in Melbourne the course can be completed in four calendar years but students in the upper classes are required generally to work in the school during vacation periods. In New Zealand the dental course is five calendar years in length. The trend of dental education in Australia and New Zealand is toward the blending of what is best under the English system of dentistry (depth of instruction in the basic sciences) and the American system (high degree of technical skill).

The Institute of Dental Research in Sydney is supported by funds from the Medical Research Council, the State Commission on Hospitals and other sources. Its basic researches concern dental problems related to chemistry, physics, mathematics and to the various fields of medical science. The University of Melbourne has a separate University Dental Research Department, as does the University of Otago, New Zealand. The Commonwealth Bureau of Dental Standards, located on the campus of the University of Melbourne, is concerned with research and standardization of dental materials in Australia.

Caruth School opens

Baylor D.J. 5:28-29 Fall, 1955

The Caruth School of Dental Hygiene, of Baylor University, Dallas, Tex., opened September 19, 1955. The school was established through the generosity of Mr. W. W. Caruth, Jr., and the Caruth Foundation. Twenty-nine students enrolled for the first trimester's work in English, chemistry, biology, oral hygiene, dental anatomy, introduction to dental assisting, and first aid. Students are taught by members of the faculty of the Baylor College of Dentistry and other specialists appointed by Baylor University. The first class will complete its two-year course by June 1957. Applications are being taken for a second class to begin September 1956.

Applicants must be young women between the ages of 18 and 35, in good health, neat appearing, possessing a pleasing personality and a sincere in-

terest in people. Graduation from an approved high school is required. Preference in admission is given to young women who are residents of Texas and nearby states which have no dental hygiene education facilities within their state. On graduation the student will receive a certificate in dental hygiene and will be eligible to take the state board examination in dental hygiene in Texas and in other states. Academic credits earned in the two-year dental hygiene curriculum may be applied to the requirements for a bachelor's degree at the Arts and Science College of Baylor University in Waco.



Practice administration

Diabetes in dental practice (Diabetes und der Odontologie)

E. Martinez. *Zahnärztl. Rundschau* 64:380
July 20, 1955

Many conditions seen in daily dental practice demand close cooperation between dentist and physician. Changes in mucous membrane and adjoining tissues in the oral cavity may be caused by diabetes, beriberi, scurvy and other deficiency diseases—conditions of real concern to both the dental and the medical profession.

In diabetes, the most important alterations involve all tissues of the oral cavity and include such pathologic manifestations as gingival hemorrhage, abscesses, bluish gums, loosening of the teeth, alveolar resorption without immediate cause, hypersensitivity of the teeth during percussion, dryness of the lips, foul odor of the mouth, fissures on the tongue, and different forms of edema. The mucous membrane is inflamed constantly.

Diabetes frequently is uncontrolled long before the correct diagnosis can be made. The dentist often will be the first to recognize diabetes, and he should immediately refer the patient to a physician. Oral surgery should be attempted only after consultation with the patient's physician. The patient should be specially instructed in the importance of oral hygiene. When infections are present, antibiotic therapy (1,200,000 units of

penicillin in 24 hours) is recommended. Cysts and teeth should not be removed before a sufficient injection of insulin has been administered. A local anesthetic should not include epinephrine or its derivatives, and strict asepsis must be observed. Hemorrhage should be prevented or, if it occurs, should be stopped immediately. The extraction of involved teeth is preferable to prolonged treatment in instances of focal infections, severe periodontosis and apical injuries. More than 60 per cent of diabetic patients over 60 years old are without teeth. In about 40 per cent of diabetic patients over 40 years old, periodontal disease is present. It is necessary, therefore, that the dentist observe even the slightest sign of diabetes, especially the symptom of changes in mucous membrane and gingiva. Dental therapy in diabetic patients should begin as early as possible. Caries is no more frequent in diabetic patients than in others.



Ethics

A program for dental emergency treatment as an aid in improving public relations for district dental societies

Kenneth J. Ryan. *J. Michigan D.A.*
37:227-229 Nov. 1955

Dentistry's relations with the public have deteriorated in recent years. Today, dentists are too busy, they work shorter hours, and they and their office personnel may lack tact in handling persons requesting emergency treatment. District dental societies could improve the situation by studying the need for emergency dental service and instituting a program to meet that need.

Four types of conditions that necessitate this type of program include treatment of postoperative bleeding, daytime emergencies, night or week-end emergencies, and services for strangers or new members in the community.

Emergencies involving postoperative bleeding may, if not cared for, result in bad publicity. The society can adopt rules which the dentist should observe. The dentist who does extractions or sur-

gery should assume responsibility for caring for bleeding and other postoperative complications after hours; he should have his home telephone listed clearly, and a plan should be made for handling his emergencies when he is unavailable. In large communities, the district society should try to make hospital dental service available.

The daytime emergencies, involving such things as toothaches and broken permanent incisors, might be cared for by having all dentists agree to set aside the hour from 1:00 to 2:00 P.M. daily for emergency service.

Possible solutions to the night or week-end emergency include the following: (1) setting up a central emergency center in a hospital, manned by volunteers from the dental society, and (2) organizing a system similar to the medical telephone answering service, which would have a list of dentists on call each night and weekend (all dentists to serve on a rotation system).

People who seek dental service should be able to find a dentist without being turned down by half the dentists in the telephone book. Each dentist should be courteous when it is necessary for him to refuse to accept new patients; it would be helpful if he could refer such people to at least three dentists who have said they would accept new patients. Each community has some good dentists who are not as busy as their colleagues. Much good will could be won if the busy dentist would say: "I am sorry, Mrs. Jones. At present I have a very full schedule and cannot accept new patients, but I would recommend Drs. X-Y-Z, who I am sure will be able to see you very soon."

A discussion of problems that arise in the referral of patients for oral surgery

David H. Grimm. *Washington D.J.*
24:14-15 Sept. 1955

In modern dental practice it may become necessary for the general practitioner to refer patients to the oral surgeon for consultation or treatment. Some of the mistakes frequently made in the referral of patients are discussed.

It is no admission of inadequate knowledge, skill or experience to refer a patient. Each professional man should be competent in his profes-

sion, but, practically, it is impossible for him to be proficient in every branch of it. The operative procedure which the oral surgeon is to perform should never be belittled. In many instances the doctor who is to do the work finds a very complicated condition that will involve time and an adequate background of experience and skill.

A doctor in a specialty such as oral surgery should be willing to help his professional colleagues if he can do so without jeopardizing his own professional standing. The specialist cannot do everything that is demanded of him if it be against his professional judgment. Whether surgery should be performed should be left to the judgment of the referee. If the patient is in poor physical condition and if further surgery would jeopardize the patient's health, the surgeon would be unwise to operate. A problem that arises too frequently is that of a patient being referred to an oral surgeon for treatment of an extensive cellulitis which is a sequela of an operative procedure by the doctor referring the patient. The patient should have the best care possible including, in many instances, hospitalization. Too often this procedure provokes the referring doctor, who may feel that such a step overemphasizes the gravity of the condition; the referring doctor should be thankful that his patient is being cared for adequately. The matter of fees should be the concern only of the patient and the doctor to whom he has been referred. The referring doctor should not suggest the course of treatment to the patient, for if these suggestions are not carried out the patient becomes confused. The referral of minors should be done only with the consent of the parent or guardian, preferably in writing, before treatment is started. Old or inadequate roentgenograms should not be sent when referring patients for surgery, because new ones will have to be obtained before treatment is started.

The problems that arise in the referral of patients are by no means the fault of the general practitioner alone. There are many instances in which the oral surgeon handles these situations poorly. The patient should be treated with care and consideration; time should be taken to become acquainted, and the procedure, the possible postoperative results and the cost of treatment should be explained. It is unwise for the oral surgeon to assume a superior attitude.

Most oral surgeons have limited their practice to surgery because they are happier doing this work or feel that they can perform this type of work more proficiently. They should have acquired additional training in surgery before limiting their practice. This is no reason for assuming a superior attitude. The oral surgeon should know his limitations. If further consultation is indicated, he should first notify the doctor referring the patient. Copies of any reports sent him by other consultants should be sent to the referring doctor, who should also be kept informed on the progress of the treatment. The consent of the referring doctor should always be obtained before any treatment other than that for which the patient was referred is considered. There are problems in general dentistry that the oral surgeon has forgotten or of which he was never aware. A discussion with the general practitioner may clarify uncertain points of diagnosis and treatment. The oral surgeon should not make a diagnosis without examining the patient thoroughly, both clinically and roentgenographically, and obtaining an adequate history. The oral surgeon should never make a remark in the presence of the patient that could reflect on the referring doctor's ability or judgment.

If undergraduate students received adequate instruction in the referral of patients for consultation and treatment, there would be fewer problems arising.

Problems and procedures of a grievance committee

Fred Barnhart. *Washington D.J.*
24:10-11 Sept. 1955

A grievance committee is a regular standing committee appointed annually, and charged with the interpretation and enforcement of the by-laws of the Society and the *Principles of Ethics* of the American Dental Association. To it are referred all complaints, protests and matters pertaining to ethics. Actually, 99 per cent of its work is devoted to complaints against members of the Society by the general public. The committee has more of a public relation function than a judicial one. It attempts to protect the public from unethical procedures, and the dentist from "cranks"

and ill-advised lawsuits. It is more successful in the latter regard than is generally supposed.

Dental services constitute a necessity, not a luxury. They are sold in competition with a thousand and one products and services designed, advertised and financed to appeal to the public. Most other products and services are sold on a basis of a money-back guarantee or a free home trial. Dental services cannot be sold under such conditions, but many patients find this hard to understand. A well-organized and functioning judicial or grievance committee, by maintaining a high level of public relations, may well prove to be the most important committee in the Society. Complaints against dentists are fairly well divided between overcharging and unsatisfactory results. Most people will overlook the price element if they feel they have received adequate service for their money, but almost all will rebel against high fees and poor service. Dentists are entitled to fair fees and the patient is entitled to adequate service. For the dentist to ignore the golden rule is to court disaster. Even one or two careless or worthless practitioners can cause the entire profession to suffer in the general opinion of the public. The grievance committee can be the means of controlling such practitioners if the committee is supported by the membership from the president to the newest member.

The grievance committee will be spared much trouble if the membership follows these suggestions: (1) each dentist must recognize his limitations; no dentist is perfect in all phases of dentistry; (2) the patient should not be oversold; the proposed dental treatment should be within the patient's ability to pay; (3) an estimate of the cost of the proposed dental treatment should always be given the patient; this is the ideal time to convince the patient of the necessity of the work and to justify the fee; (4) consideration should be given to refunding the fee to a dissatisfied patient; a nagging patient will waste the dentist's time, cause him mental anguish, and upset his office routine. No one should consider a refund as an admission of failure or a lack of professional ability. Often there may be a clash of personalities between dentist and patient which precludes any chance of successful treatment. A refund keeps the patient from becoming an enemy of the entire profession.



Auxiliary groups

The profession and the dental technician

Editorial. *J.Canad.D.A.* 21:631-632 Nov. 1955

As the demand for dental care far exceeds the total time available by all dentists, many time-consuming procedures are performed to greater advantage by auxiliary personnel working under the direction of the profession.

Technicians have a responsibility to the dental profession to carry out the indicated procedures to the best of their ability. Dentists, likewise, have a responsibility to their technicians. Most of the problems which arise in respect to the illegal practice of dentistry could be almost eliminated if each dentist acted in complete fairness with the technicians who perform his laboratory procedures.

A qualified dental technician is a highly trained and skillful artisan. He is entitled to a reasonable fee. Most technicians strive to be fair; their charges must be based on the cost of operating their laboratories and on the expectancy of a reasonable standard of living. Dentists should be fair with the technicians, and willing to pay an amount which is reasonable and honest.

It is a dentist's legal obligation to write a prescription for each technical service desired. Failure to do so places the laboratory in an untenable position and opens the door to infractions of the regulations. Illegal practice in many parts of Canada is a serious problem. Dentists, by adhering strictly to the regulations, can do much to eliminate the causes of this condition.

Patient-technician relationship in dentistry

Jack B. Rice. *M. Tech. Bul.Supp., U.S. Armed Forces M.J.* 6:244-246 Nov.-Dec. 1955

The dental assistant should aim to make the patient feel more at ease. Starting a conversation on any light subject will tend to divert the patient's mind from his ordeal. Dental instruments which might frighten the patient should be kept out of

sight. Equipment, instruments and personnel should be immaculate. The technician should maintain good oral hygiene. Certain dental procedures and the reasons they are done in certain ways can be explained to the patient.

In treating children, each person within the dental clinic, from the dentist to the most non-professional technician, should remember that his action is helping to form the child's attitude toward dental treatment. The child should receive explanations of pending dental treatment, in terms understandable to him. A child handled properly by the dental personnel, and by the parents, will develop into an ideal patient.



Dentistry in government

Dental care

Stat. Rev. Navy Med. 11:29-32 Oct. 1955

Dental treatment rendered by the dental department of the U.S. Navy constitutes a major part of the workload of the over-all medical program. An individual in need of dental care can be as non-effective as one with an injury or disease requiring medical care. Dental care is provided for Navy and Marine Corps personnel in most of the larger land, sea and air activities, whether afloat or ashore.

During the fiscal year 1955, Navy dental facilities reported 4,272,359 dental procedures, of which operative dentistry accounted for three-fourths of the total, oral surgery for 12 per cent, periodontics for 11 per cent, and prosthodontics for 2 per cent. One type of procedure dominated each of the four selected dental classifications. In operative dentistry, restorations (amalgam, resin and silicate) accounted for 68 per cent of the total. Dentures (both complete and partial) comprised two-thirds of the prosthodontic treatments. Tooth removal comprised 91 per cent of oral surgery treatments, and oral prophylaxis accounted for less than a half of the periodontal treatment.

Most of the dental treatment rendered was to Navy and Marine Corps personnel on active duty.

Supernumeraries accounted for less than 2 per cent of the dental procedures. Most dependent dental care is given at naval activities outside the continental limits of the United States.

More than a fifth of the dental procedures were performed at the five recruit training activities. A dental examination is required for recruits entering basic training. About 125,000 recruits entered the naval service during the 1955 fiscal year. Of those examined, about 92 per cent required treatment; 90 per cent required restorative dentistry. About a third in addition were in need of extractions. Six per cent of the Navy recruits and 4 per cent of the Marine Corps recruits required dentures. In all, 905,821 dental procedures and treatments were provided at recruit training facilities during the 1955 fiscal year. Operative dentistry accounted for 653,003 procedures, or 72 per cent of the total. Oral surgery accounted for almost 250,000 treatments, or 22 per cent of the total; periodontal treatment accounted for 4 per cent, and prosthodontic treatment for less than 2 per cent of the total.



Group dental health programs

The present status of prepayment dental care plans

Morris Brand. *Pennsylvania D.J.*
22:2-12 Nov. 1955

Of the 10.2 billion dollars spent in 1953 for health care in the United States, it is estimated that 1.6 billion dollars (16 per cent) purchased dental service. Of the average net cost of \$178 per family for all medical service only \$33 was spent for dental care as compared to \$75 for physician's care. In 1953, 50 per cent of all hospital charges, 38 per cent of all surgical charges and 13 per cent of physician charges were paid by insurance carriers. It is estimated that up to 3 per cent of the total dental bill is covered by prepayment plans.

Dental costs are distributed unevenly among families. Forty-four per cent of all families (66

per cent of all individuals) incurred no dental bills, 35 per cent incurred bills up to \$45 and only 4 per cent incurred charges in excess of \$195. Families with annual incomes between \$2,000 and \$3,000 spent an average of \$6.62 for dental care compared with an average of \$67.84 for families in the \$6,000 to \$7,500 income group.

Various dental health plans since 1922 are reviewed, including dental health services offered by various industrial plants, by the Farm Security Administration, by private dental clinics, private insurance companies, cooperative organizations, labor unions, employers, mutual aid societies and private group clinics. Though the dental profession has been adopting principles relating to dental health plans and has been urging experiments, the dental profession in the past decade has failed to start pilot projects in the various types of prepayment dental plans that are possible. Such experiments, if conducted and evaluated properly, would lead to added knowledge. The dental profession should not fear making mistakes.

The dental profession has the responsibility of cooperating with all bona fide groups wishing to begin dental programs.

Dental service at Corning Glass Works

Howard DeCamp. *Indust. Med. & Surg.*
24:499 Nov. 1955

Since 1925 the Corning Glass Works at Corning, N.Y., has maintained as an integral part of its medical service a dental health program. The dental clinic serves about 7,000 employees and company pensioners. The director of the dental clinic serves full time on a monthly salary. Work at the clinic is confined to relieving toothaches, roentgenographic examination, extractions, and adjusting prostheses when they are irritating or uncomfortable.

The results have been gratifying. Absenteeism caused by toothache or illness caused by dental infection has been reduced. The workers come voluntarily. No charge is made for the service. The program has the support of the dental and medical practitioners in the area.

Operative dentistry



Inlays and fillings

Some common causes for failures of materials in operative dentistry

Ralph W. Phillips. *J.N.Carolina D.Soc.*
38:241-246 Aug. 1955

Although the perfect restorative material has not yet been made, the several materials in wide use in operative dentistry do have adequate chemical and physical properties. Their clinical success depends to a great extent on a knowledge of their properties and intelligent manipulation. Various factors may cause clinical failure.

Approximately 40 per cent of all failures of amalgam can be attributed to faulty manipulation of the alloy. The manufacturer's recommended mercury-alloy ratio must be followed, and some type of weighing or proportioning device is indicated. Undertrituration results in a severe loss in strength. Insufficient condensation is a common cause for fracture of amalgam. Because amalgam restorations are fragile during the first few hours, the patient must be warned to refrain from biting on the restoration during this period. Severe expansion of amalgam accounts for 16 per cent of all failures. Expansion is caused by one thing only—contamination of the alloy with moisture.

For the gold inlay, maximum accuracy is imperative. Most failures are associated with this problem; a common fault is failure to control distortion in the wax pattern. Some types of wax patterns will begin to distort as soon as they are removed from the cavity preparation or the die. Therefore, the pattern must be invested immediately on removal from the cavity preparation. Hydrocolloid or alginate impressions must be poured as soon as possible after removal from the mouth; there is no storage environment which will prevent distortion. Other factors which will

assure maximum accuracy are: (1) use of water no colder than 60° F. for chilling the impression; (2) allowing the hydrocolloid to gel for at least five minutes before removal, and (3) removal with a snap thrust in a direction parallel to the long axis of the tooth. The cement is an integral part of the inlay. The primary factor controlling the solubility and strength of zinc phosphate cement and silicate is the powder-liquid ratio. The only way that a maximum amount of powder can be incorporated is by chilling the slab before mixing. Bottles of cement and liquid should be kept tightly stoppered.

Failures with the self-cured resins are associated with the inherent shortcomings in the physical properties of the material. A main disadvantage of such resins is the high thermal coefficient of expansion. Many resin cements now on the market contain filler materials added to reduce the coefficient of expansion.

Treatment of hypersensitive dentin with Argento-zinc (Behandling af

Perifer Dentinhyperaesthesi med Argento-zink)

Steen Børglum Jensen. *Tandlaegebladet*
59:525-531 July 1955

Treatment of hypersensitive dentin is a problem in spite of many medicaments claimed to relieve the symptoms. Hypersensitive dentin causes pain from mechanical, thermal or chemical stimuli which normally would be insignificant. Hypersensitive dentin occurs when the enamel of the crown is destroyed by abrasion or erosion, or when the cervix of the tooth is laid free by retraction of the gingiva or by gingivectomy. Various methods used in the past are discussed (Percy Howe, Gottlieb, Younger, Crawford, Gisler, Lukomsky, Effinger).

At the Royal Danish Dental College, Copenhagen, 37 patients were treated with Argento-zink, consisting of: silver ferrocyanide 12 per cent, zinc ferrocyanide 18 per cent, zinc chloride 35 per cent, water 30 per cent and filler (containing a wetting agent) 5 per cent. The effect is explained as an adsorption of the complex molecules of the Argento-zinc to the protein, thereby reducing the permeability of the dentinal tubules. No nitrate is present, the only etching effect being

caused by the zinc chloride. Prior to application the hypersensitive dentin must be cleaned mechanically with pumice and washed and dried with alcohol and chloroform. Application requires a dry field. After 3 to 4 minutes the paste is removed and the treated region may be covered by lacquer. It is important to remove all paste to avoid damage of gingival tissue. The treatment was found to give complete relief in 25 out of 37 patients; 23 required only one application, whereas two required 2 to 3 treatments. In eight patients the symptoms were reduced so that sensitivity was only noted by thermal irritation, whereas the teeth did not react to mechanical stimuli. In four patients the application did not relieve the hypersensitivity, and these patients did not respond to other desensitizing treatments. In no instance did the Argento-zinc treatment result in discolorations. No recurrence of hypersensitivity was found after successful treatment. No clinical symptoms of pulpal damage were observed. Histological examinations are planned.—*G. Ryge*

Metal casting in dentistry: a new method
(Contribution au problème
de la coulée des métaux en art dentaire)

E. Pennino. *J.D.Belge* 46:175-183
May-July 1955

Various technics for casting have been introduced, including the thermal expansion compensation technic. Despite its application over a period of many years, this method still may produce different results under different conditions.

Extensive studies have been conducted on dimensional changes of materials employed in construction of castings. The composition of certain investments and their resistance to thermal expansion, especially in regard to resin materials (insoluble in water but easily dissolved in alcohol, ether and volatile oils), were investigated.

In several investments, no significant difference was observed between castings made by the hygroscopic and by the thermal expansion method. A different and new technic, using water-glycerine and potassium sulfate mixed with Kerr's cristobalite investment permits injection of the investment into the cylinder by centrifugal force,

and achieves a capacity of resistance to thermal expansion of resin as well as other materials. This method also allows the cylinder to be heated rapidly (15 minutes after investment) and prevents breaking.

Cavity preparation must be based on sound principles in harmony with tooth morphology. In the inlay cavity, undercuts should be avoided. All parts should be examined, especially the walls, line and point angles. Failures of amalgam restorations are often unjustly blamed on the material but are caused mainly by a lack of understanding of the basic principles in relation to the characteristics of amalgam. Gold alloy, used for inlays, differs from amalgam. Inlays must confer strength to the tooth structure by binding together the component parts. This will be more perfectly achieved by gold inlays than by any other material. Unfortunately, the value of gold foil still is controversial. Dentists who fail to acquire sufficient knowledge regarding the preparation of cavities for gold foil and who do not master the correct technic usually abandon its use. Consequently one of the most effective services to patients is eliminated. Silicate cement is now widely used, for it offers a simpler and temporarily more esthetic result. Gold foil, however, is unexcelled as a restorative material when its use is indicated. The important point is that careful and exact observance of the accuracy of all reproductions must be maintained.

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Rehabilitation or equilibration

**The why and how of cuspal harmony
in the lateral ranges**

B. C. Kingsbury. *J.Prost.Dent.*
5:783-800 Nov. 1955

A technic is described and illustrated for establishing cuspal harmony in the lateral ranges of occlusion for (1) those patients in whom no change is made in the vertical maxillomandibular relationship, and (2) those patients in whom the vertical opening is increased. Cuspal harmony is the most important and least understood problem

of adult dentistry on natural teeth. Failure to establish cuspal harmony in natural teeth is more responsible than any other one factor for an appalling loss of thousands of teeth that should have been saved. Treatment to establish cuspal harmony is not time consuming, nor does it require considerable material or expensive equipment.

The working jaw exerts about 180 pounds of pressure a square inch on the passive jaw. That force, exerted thousands of times a day, is capable of causing tissue destruction unless all parts are performing harmoniously. If only a few teeth do all the work, the result often is disastrous. Sixty per cent or more of periodontal diseases are caused by malocclusion. Eighty per cent of the teeth that escape extraction because of caries in youth are lost at the age of 50 through the ravages of periodontal diseases.

Prosthodontists and orthodontists are now directing their attention toward attaining balanced occlusion for their patients. Periodontists have known for years that one of the most effective treatments for periodontal diseases is the establishment of cuspal harmony. Fully 90 per cent of people with natural teeth at age 20 and over would be benefited by being given occlusal adjustments, and many of these would require only minor changes. Few people have satisfactory cuspal harmony in the lateral ranges. In those patients where no increase in the vertical opening is necessary, the grinding of a few high cusps and the building of others is all that is needed to obtain cuspal harmony. The final forward and downward growth of the face occurs between the ages of 16 and 19. The work of establishing cuspal harmony should be started at age 20, while the investing tissues are normal and the vertical height is satisfactory.

When all cusps have been ground or built to their maximum physiologic efficiency to form the upper and lower occlusal planes, the following conditions prevail:

1. The mouth functions properly in all mandibular positions.
2. A maximum number of opposing teeth is in contact in all positions.
3. The teeth have maximum crushing and shearing powers.
4. Mastication is carried on with less pressure,

and stresses are exerted more nearly through the long axes of the teeth.

5. The investing tissues are best able to withstand and absorb stresses.

Radical adjustment of the incisal balance is seldom advisable, because of the vertical overlap; but right and left lateral balances can be developed in most mouths.

Five methods of reconstruction are possible: the control crown method, the plate method, the splint method, the balanced occlusal guide method, and McCollum's method. The control crown method is described. A rule that applies to centric and lateral ranges is this: If a cusp is right in two positions, it is right. Any cusp that interferes with or does not occlude with another cusp that is right must be altered. It must either be built up or ground off to harmonize with the cusp that is right.



Pedodontics

Teething

Charles E. Oxar. *J. Florida D.Soc.*
26:9-10 Nov. 1955

Teething, a term applied to the physiologic process of tooth eruption, frequently is associated with painful symptoms. The teething problem may occur between the sixth month and the end of the second year; it seldom occurs during the eruption of the permanent teeth. The exact age when the problem may arise cannot be predicted because of endocrine factors, familial tendencies, diseases and infections, the infant's mentality, and so forth.

Among the symptoms that may accompany teething are the following: irritability, restlessness, inability to feed or to sleep properly, pruritus, diarrhea, chills and fevers, otitis, convulsions, coughs, rhinitis, anorexia, vomiting, increased salivation, finger sucking and jaw grinding. "Teething rash," caused by constant or intermittent drooling, may create a mild herpetic eruption about the mouth, chest and arms. The "teething cough" is a laryngeal irritation, possibly reflecting

disturbances of the fifth nerve. Inflammation of the gingivae, commonly seen during teething, may be caused by other factors. Lancing of the gums has been deplored by Witkins, Schartzmann, and Poncher, Schour and Massler.

The ease with which the erupting tooth penetrates the overlying soft tissues varies in each child.

Active drugs should not be used in treating teething symptoms except when indicated by a physician or dentist; indiscriminate medication may be harmful.

Why do children suck their thumbs?

R. W. Cumley. *Psychiatric Bul.* 5:50-53 June-Aug. 1955

Different babies have different hunger cycles, and therefore the weaning period for some should be later than for others. If the baby persists in wanting the bottle beyond the expected period of feeding, it usually means that he needs more sucking activity to satisfy some inner urgency.

In order to compensate for this desire, many children begin to suck their thumbs. In many instances, this habit will not cause permanent harm. Sillmann's serial examination of 60 children from birth to the fourteenth year revealed, however, that vigorous thumbsucking can cause severe displacements in oral structures during the first four years. After thumbsucking was stopped, in most of the instances reported, spontaneous correction occurred. Therefore, it can be assumed that if thumbsucking ceases before the period of the permanent dentition, no lasting damage will have been caused.

It should be recognized, however, that before and during the eruption of the deciduous teeth, an absolutely normal physiologic urge may provoke the child to bite constantly on his gums. This habit (and its cause and result) should not be mistaken for a variation of thumbsucking. If this gum-biting persists after the eruption of the deciduous teeth and after the physiologic impulse has been satisfied, then a persistent thumbsucking may be indicative of a specific physiologic need.

Prolonged thumbsucking after the age of four usually is a symptom that the child suffers from emotional starvation, and that he uses his thumb

for comfort and compensation. Or, if the child is angry or resentful, he may use thumbsucking as a means of revenge against his parents instead of the usual source of an independent pleasure.

Frustration of the child's underlying desire for compensation by interference instead of fulfillment of his need only produces anxiety.

When the oral want is frustrated, the child may begin to bite his fingernails. Actually, no therapy nor educational corrective measure is necessary or desirable during infancy or when thumbsucking is practiced during sleep only. Parental interference at this stage usually entrenches the habit. The best corrective measures are indirect adjustments such as providing adequate rest and play outlets.

Most children will stop thumbsucking by the age of five. At this age, if the habit has persisted, the child is capable of self-discipline, and can only be helped by helping himself.

Psychological effect of fractured incisors

Geoffrey L. Slack and John M. Jones. *British D.J.* 99:386-388 Dec. 6, 1955

The psychological trauma which may follow the fracture of permanent incisors in children aged 7 to 9 is in many instances underestimated or overlooked. The former practice at the School of Dental Surgery, University of Liverpool, was to postpone the restoration of contour and function until the child was about 12 or 13 years old, by which time the risk of recurrent trauma is considerably less and the biologic repair of the damaged tissue has occurred. In recent years it has become increasingly evident that the above practice often was not in the best interests of the patient. The policy has been changed. It is important that the child's appearance be restored to normal as soon as possible. The consciousness of being "different" from other children, the teasing at school and the family disappointment at this blow to beauty are sufficient to cause psychologic disturbances in many children.

A nine year old boy attended the clinic a week after an accident in which four incisors were fractured. A month later his mother reported that his progress at school and his behavior elsewhere had deteriorated. He had lost his place in two choirs

because of a lisp in the form of a whistling S; and, in an endeavor to overcome this fault, over-correction had resulted in the development of a TH which was attributable to the tenseness of his tongue.

He had changed from an active, high-spirited boy to a quiet, moody child. His sleep was disturbed. The boy had become self-conscious about his failures.

A speech therapist found that the dental condition in itself was insufficient to account for the defect in voice production. Complex dental treatment was undertaken, and treatment in the speech therapy department was arranged to relax the boy's tongue and restore confidence in his diction, particularly with regard to S and TH. Within a few months the boy's outlook became brighter and he began to regain confidence. His appetite improved, there was a gain in weight and he now slept well. He was reinstated as the choir soloist and was successful in obtaining a scholarship to a public school.

It is important to recognize the possible effect that dental disfigurement may have on the mental outlook of children. Whenever practicable, immediate restoration to normal appearance is advisable.



Miscellaneous

Diagnosis in the dental office of the future

Arthur Elfenbaum. *Fort.Rev.Chicago D.Soc.*
30:9-12, 24-26 Nov. 15, 1955

While dentistry's boundaries are being extended, the new horizons of medicine are being pushed

practically beyond view; the medical profession is gradually relinquishing its responsibility for the mouth and is welcoming the cooperation of the dentist when oral problems arise. Dental schools are emphasizing the study of oral pathology and oral medicine as well as the study of oral-systemic diseases.

The time is near when the medical profession and the public will expect the dentist to be the mouth physician. The dentist of the future will be expected to be able to restore the oral and dental structures to perfect harmony in function and esthetics; he will also be held responsible for recognizing the oral manifestations and roentgenographic aspects of many systemic diseases.

Dentists are learning, when making a diagnosis, to take into account the total patient—the complete soma or body and the psyche or mind, as well as the total environment in which the patient lives—his home and family, his vocation, avocations and social life, his thoughts and moods, his personality and behavior patterns, even his politics and religion.

Recently the dentist has taken a new interest in the intraoral roentgenogram. Many diseases of the skeleton, endocrine glands and metabolic processes leave their stigmas in the teeth and bones, and the evidence frequently is best seen in the intraoral roentgenograms.

The dentist of the future will be considered as part of a team of physicians devoted to the healing arts and sciences. A tooth will be thought of as an animate object attached by its root to a living human being. The mouth will be included as an integral part of the body. Abnormalities in the teeth, oral soft tissues, jaw bones, masticatory musculature, temporomandibular articulation or any part of the stomatognathic system may be found to be correlated with diseases in other parts of the body.

Doctoral and Masters' dissertations



In this column each month are listed recent Doctoral and Masters' dissertations of dental interest, accepted by the dental schools or graduate schools in partial fulfillment for advanced degrees. Copies of many of these theses are available from the schools through interlibrary loan.

A cephalometric study of relationships of the maxillary and mandibular central incisors of children having excellent occlusion and Class II, division I malocclusion. *Richard O. Failor*. 1954. M.S. University of Washington Graduate School.

Apical root resorption under orthodontic therapy. *John R. Phillips*. 1953. M.S. University of Washington Graduate School.

A study of methods of measuring marginal penetration of dental restorations with emphasis on the use of radioactive phosphorus. *Harold E. Schnepfer*. 1954. M.S. University of Washington Graduate School.

A cephalometric study of the relative position of the mandibular condyle before and after treatment of Class II, Division I, malocclusion. *John P. Anderson*. 1955. M.S. University of Washington Graduate School.

A clinical evaluation of aseptic technic on post-operative complications following the removal of impacted mandibular third molars. *Joseph Gerard Chudzinski*. 1954. M.S.D. Northwestern University.

A clinical investigation of the effect of local application of alginic acid and chlorophyll following surgery of the mouth. *Mark DeBoer*. 1954. M.S.D. Northwestern University.

A study of the variability of cephalometric landmarks. *Marion Fries Dick*. 1954. M.S.D. Northwestern University.

A radiographic and clinical evaluation of a method for determining the transverse axes of the movement of the mandible. *Harry Clement Good, Jr.* 1954. M.S.D. Northwestern University.

A study of the facial-skeletal and dental changes of Class II Division I malocclusion (Angle) by orthodontic treatment and three or more years after active treatment. *Edwin Masaru Hagihara*. 1954. M.S.D. Northwestern University.

A study of the dimensional stability of the self-curing denture base resins. *Philip Marion Jones*. 1954. M.S.D. Northwestern University.

A cephalometric radiographic study of the sagittal condylar and incisal paths of mandibular movements following orthodontic treatment. *Paul Edwin Klein*. 1954. M.S.D. Northwestern University.

The effect of Koagamin on the coagulation of blood. *Benjamin Leo Lynch*. 1954. M.S.D. Northwestern University.

A clinical comparison for operative procedures of four local anesthetic agents used in dentistry (1953). *Clarence W. B. McPhail*. 1954. M.S.D. Northwestern University.

An electromyographic study of the temporal and masseter muscles of individuals with excellent occlusion and Angle Class II, Division 1 malocclusion. *Harold Tyner Perry, Jr.* 1954. M.S.D. Northwestern University.

A study of the effects of synthetic bone paste when used in conjunction with autogenous bone grafts. *Joseph Frederick Walborn*. 1954. M.S.D. Northwestern University.

A histologic study to determine the effectiveness of the 'Berliner self-limiting epithelial scalpel' in removing the epithelial lining of periodontal pockets. *Frederick William Wertheimer*. 1954. M.S.D. Northwestern University.

A cephalometric study of the growth and development in cleft lip and palate individuals from birth to four years. *Raleigh Thomas Williams*. 1954. M.S.D. Northwestern University.

An objective comparison of local anesthetics. *Robert Cromwell Worley*. 1954. M.S. Northwestern University.

A study of the intraosseous relationship of the extra-oral skeletal fixation pins in the mandible. *George Fuller*. 1954. M.S. *University of Pittsburgh*.

An evaluation of tissue reaction following the use of colloid iodine in oral surgery. *Charles Ganley*. 1953. M.S. *University of Pittsburgh*.

A re-evaluation of Angle's Class II, Division I classification. *Herbert Gottfried*. 1954. M.S. *University of Pittsburgh*.

A clinical study of the incidence of pain and discomfort following the use of various local anesthetics. *David L. Henderson*. 1954. M.S. *University of Pittsburgh*.

A determination of the variation of coincidence between the visually estimated and anatomically determined median line for artificial dentures. *T. Raymond Loutzenhiser*. 1953. M.S. *University of Pittsburgh*.

Complications of intratracheal anesthetics. *Leonard Monheim*. 1953. M.S. *University of Pittsburgh*.

A study of the acute changes in bone following insertion of extra oral skeletal fixation pins at various speeds. *Henry Clay Thompson, III*. 1955. M.S. *University of Pittsburgh*.

A study of the vertical variations in the curve of occlusion in Angle's Class II, Division 1 malocclusion during the treatment. *George W. Toothman*. 1954. M.S. *University of Pittsburgh*.

The antibiotic sensitivity of the causative agents of acute cellulitis of face and neck. *John L. Campbell*. 1953. M.S. *University of Maryland*.

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